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MASSACHUSETTS AGRICULTURE

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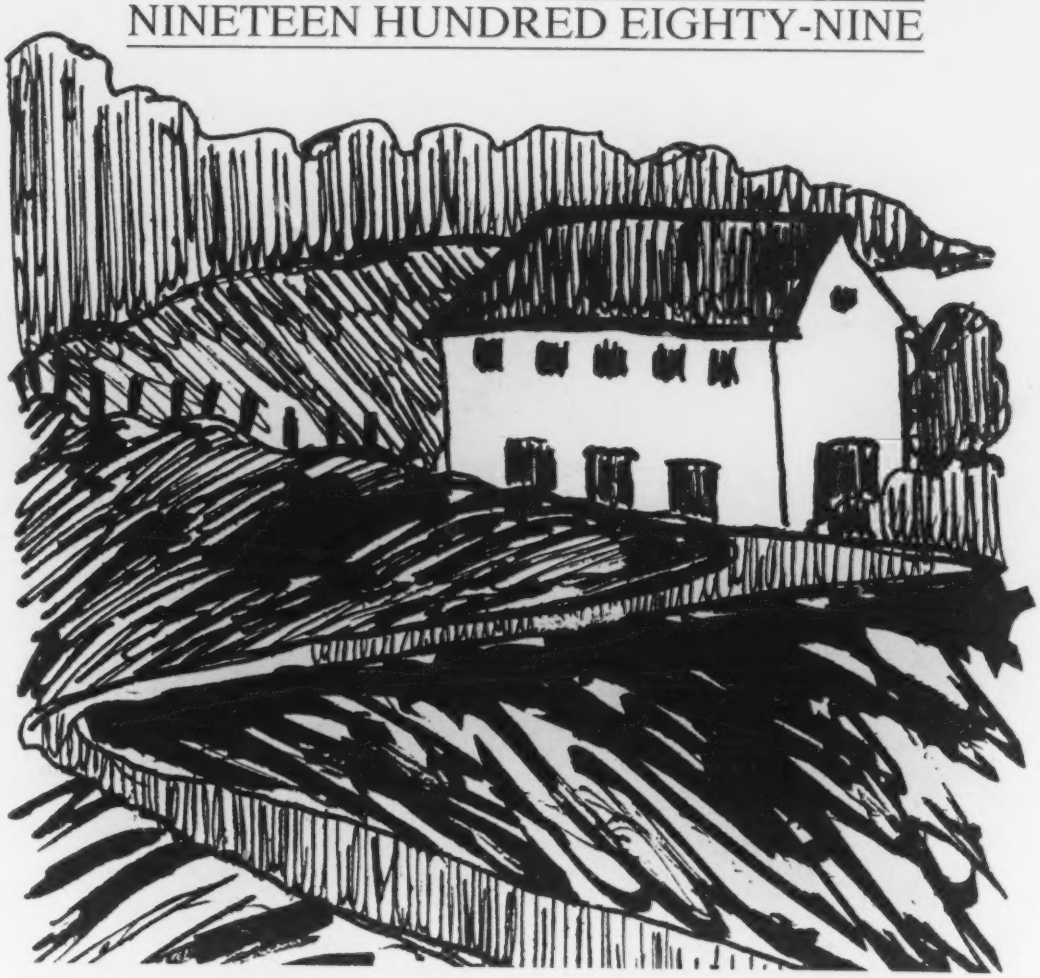

COMMONWEALTH OF MASSACHUSETTS

Department of Food and Agriculture

Michael S. Dukakis, Governor
John P. DeVillars, Secretary of Environmental Affairs
August Schumacher, Jr., Commissioner of Food and Agriculture

A Letter from the Secretary

Dear Massachusetts Farmer:

Unlike the difficult drought year of 1988, the environment was kinder to Massachusetts farmers in 1989, bringing better growing weather. This year also brought more stable prices, especially for the Commonwealth's hard pressed dairy farmers as well as strong demand for locally grown produce, especially fruits and vegetables.

The Department of Food and Agriculture made a major effort to initiate the first year of the Farm and Food Policy (1988-1993) issued in October of 1988. Continued progress was made in farmland protection through the APR program, despite tightening fiscal times, thanks to considerable contributions from the towns.

The pesticide management effort continued to evolve, with new funding from the retained revenue account, dairy inspections maintained their solid record, animal health officers and staff did an excellent job in preventing disease outbreaks and the Plant Pest Control bureau developed new initiatives, especially in dealing with difficult bee disease control.

On the markets front, strong efforts were successfully made to expand the farmers' market program, with special assistance from the now federally funded Farmers' Market Coupon Program. This year saw continued support from supermarkets and good growth in roadside stands.

Particular thanks must be given to the thousands of volunteers who so ably contributed to fairs, 4-H, youth programs and the many agricultural boards undertaking monthly tasks of advice and guidance.

Your continued support is terrific and we thank you all.

Sincerely,

John P. DeVillars
Secretary of Environmental Affairs

A Letter from the Commissioner

Dear Friends:

This, my last letter, is a difficult one to write. I will soon be leaving the Department to take up an exciting position with the World Bank in Washington, DC. I am leaving to try a different challenge, a challenge that I never thought would be available in my lifetime, of assisting in the restructuring of the farming and food systems of eastern Europe and Russia. I will be bringing many lessons from this state; lessons of stewardship of the land, of farming in harmony with the environment and of innovations in intensive market development.

I leave with confidence in the state of farming in the Commonwealth, confidence in our terrific, if overworked, department, and confidence that the new administration, working with our active agricultural board, will not only continue, but strengthen the legacies of the past two decades.

I also leave with some terrific memories, of the unity of farmers, of your rising up, like the farmers of Shays Rebellion and the farmers of Concord and Lexington, to defeat the potentially disastrous animal rights referendum in 1988, of your leadership in Integrated Pest Management (IPM) and farmland protection and your experiments with sometimes untested marketing ideas.

There are many other wonderful memories - of the great and small fairs of our state, from the Big E and Topsfield, to the Goshen Flower Show and the Littleville Hilltown Fair. But my fondest memories will be of people; of the farm family in a Berkshire town that has never left the bedside of their daughter with polio in 32 years, of Sonny Williams organizing the haylift to the drought stricken South, of Bill Hamilton and his family, selling at the Big E and at the Copley Square farmers' market, receiving an APR check, and doing terrifically well, of my good friend Gil Griggs and his family, who greatly fostered the farmers market movement in this decade. During my time as commissioner, I have made many hundreds of special friends who take pride in their multi-generational stewardship of their farms and husbandry of their animals.

I shall miss serving the farming community. Most of all I shall miss visiting with you, talking prices, issues and, most often, the weather.

Best wishes,

Gus Schumacher JR

August Schumacher, Jr.
Commissioner

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Acknowledgements

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MASSACHUSETTS AGRICULTURAL BOARDS

These board and committee members generously volunteer their time to these important groups that work to insure the integrity and success of Massachusetts agriculture. Their hard work is deeply appreciated by the Commissioner and staff of the Massachusetts Department of Food and Agriculture.

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Division of Fairs

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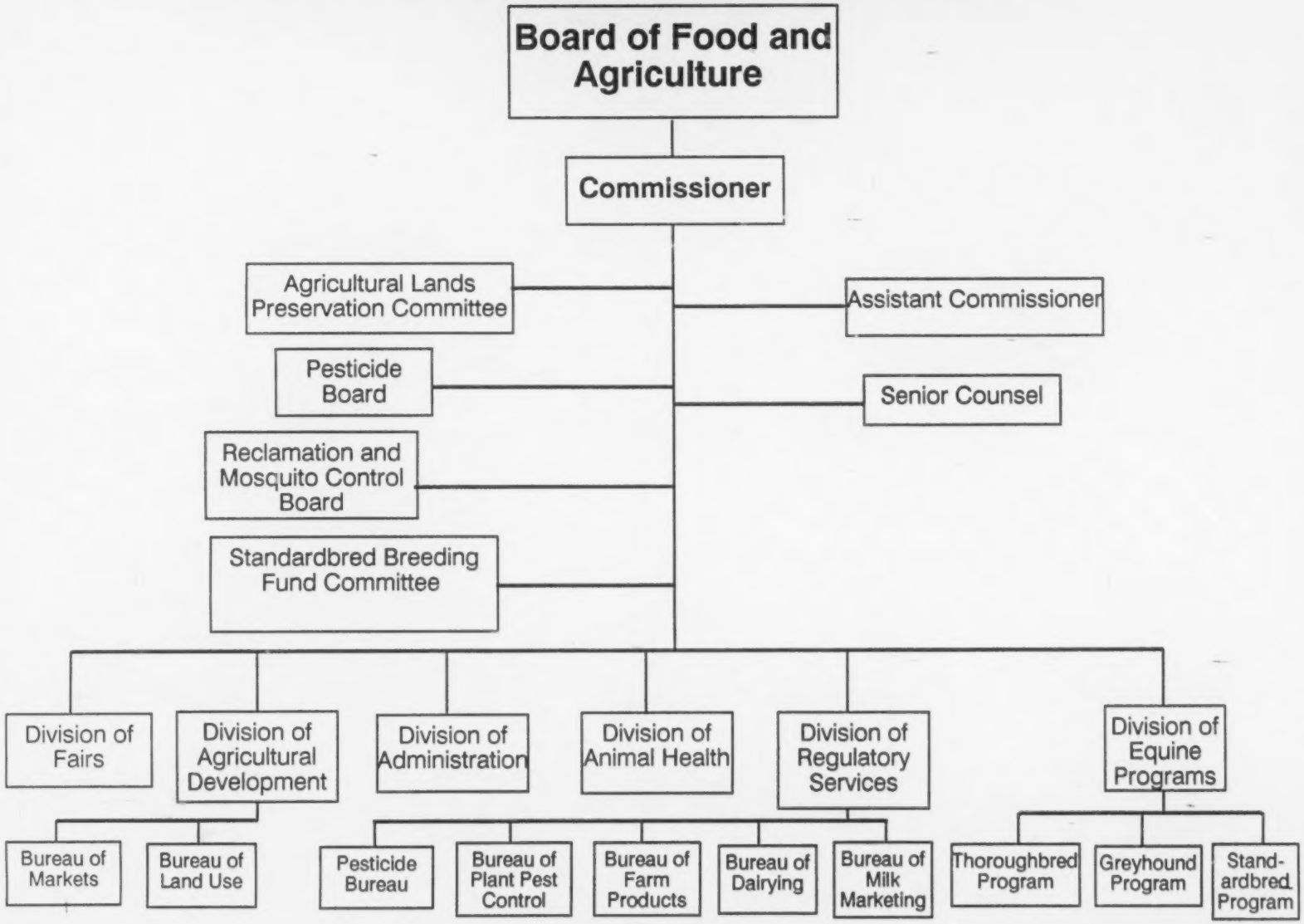
Ellen M. Hart, Head Clerk

ORGANIZATIONAL CHART
Massachusetts Department of Food and Agriculture



DIVISION OF AGRICULTURAL DEVELOPMENT

James G. Hines, Director

The Farmer's Market Coupon Program, the NASDA National Food & Agriculture Exposition at the Hynes Convention Center, tomato tasting at City Hall in Boston, the Zucchini War with the Coast Guard concerning the ship Ernestina, the Christmas Tree ceremony at Copley Square in Boston, and the Flower Show exhibit at Bayside Exposition Center were just a few of the activities during our year of excitement in Agricultural Development. As a new director with the Department, I was continually amazed at the enthusiastic attitude and outstanding capabilities of our staff. The year was one of constant motion. We continually jumped from events such as the Fine Foods Dinner to promotions such as the Coupon program which aided close to 50,000 nutritionally-at-risk citizens and helped 173 farmers pay their bills. We also had to keep a close watch on expenditures to make sure that the money we spent returned commensurate value to the Commonwealth, and I believe my staff accomplished this goal. We recognize that the primary goal of our division is to enhance the economic well being of Massachusetts agriculture. We recognize that the more dollars spent on locally produced food and fiber, the stronger our total economy. Farmers are consumers and taxpayers as well as producers.

With these facts in mind, we stressed support for expansion of the "farmers's market" system of direct marketing. We continued support for roadside stands through the legislature, as well as through the Massachusetts Association of Roadside Stands and our point of purchase development and distribution. We encouraged supermarkets to bolster the sale of "Mass Grown ...and Fresher" products. We assisted groups such as the Pioneer Valley Growers Association in their efforts to grow through the Federal State Marketing Improvement Program (FSMIP). The Coastal Growers Association, a new growers cooperative in southeastern Massachusetts, was formed with our assistance. We continue to pursue methods of improving our farmers economic viability by urging the Farmers Home Administration's Washington office to include the Thrift Fund as an eligible lender under FmHA's Guaranteed Loan Program. Also, we continue to aggressively seek funds for those farmers interested in our Agricultural Preservation Restriction Program (APR) under the Bureau of Land Use.

The Bureau of Markets continues to address the demands of our consumers to insure a level playing field with producers from other states and regions. We are working for state and national standards for the production and processing of "organic" produce. In addition, we are working closely with our Regulatory Services division to explore opportunities to market certified "IPM" produced products in response to the demand for pesticide reduced products.

In conclusion, it has been an exciting and challenging year in the development of Massachusetts agriculture. Hopefully, 1990 will be just as challenging and equally rewarding.

Bureau of Land Use

James P. Alicata, Chief

To maintain a sound agricultural economy, it is essential that a sufficient amount of land suitable to agricultural production be made available to the farming community. It is the role of the Bureau of Land Use to achieve this objective. This can be accomplished through the coordination of both the public and private sector in developing plans for land use that are compatible to both the needs of development and agriculture.

1989 was a challenging and productive year for the Bureau, highlighted by the passage and signing of an Open Space Bill which included $35 million for the continuation of the Agricultural Preservation Restriction (APR) program. Due to the previous allocation of APR funds, the Bureau was able to direct attention to alternative preservation techniques which maximize the effect of tax dollars when they become available.

Professional planning services, for example, have been employed to explore ways that values can be shifted from productive farmland to non-agricultural land that would be more suited to housing or other development purposes. By working cooperatively as a bureau and with other agencies, an awareness and appreciation of the available farmland in every community can be developed and managed. By offering communities a total package of opportunities that include the identification of active farmland through the mapping program, the purchasing of development rights through the APR program, or the proven management experience of the Massachusetts Farmland Stewardship Program and the Community Garden and Fruition Programs, the objectives of effective land use management will be achieved.

Municipal Farmland Identification Program

MFI is a three-year project which inventories and maps parcels of active agricultural land on a town by town basis. This information is valuable to the Agricultural Preservation Restriction (APR) staff in their efforts to create economically viable blocks of protected farmland. In addition, these maps serve as a useful planning tool for town boards and agencies involved in land use issues such as zoning, preservation of open space and resource protection.

1989 has been a very successful year for the MFI Program. Nearly all of the towns in Hampshire, Hampden, Franklin, and southern Worcester counties have been mapped. Martha's Vineyard has been finished and several towns in Berkshire County are presently in various stages of completion. Mapping has also been completed in a number of communities in Plymouth, Bristol, and Barnstable counties.

There has been excellent cooperation from the USDA Soil Conservation Service, which performs the final cartographic work and the Agricultural Stabilization and Conservation Service who have assisted in identifying active agricultural land through the use of aerial photographs.

A very successful pilot project between DFA and the Hazardous Waste Facility Site Safety Council (HWFSSC) during the summer produced a computer generated map of APR distribution throughout the state. This map is the first attempt at digitizing information from the Bureau of Land Use using the computer capabilities of another agency. The Bureau is currently in the process of assessing the feasibility of digitizing all of the Municipal

Farmland Identification maps which would help immensely in keeping the maps up to date as well as accurate.

APR Program

The Agricultural Preservation Restriction (APR) Program was established by the Legislature in December, 1977 to protect the Commonwealth's rapidly diminishing farmland resources through the purchase of Agricultural Preservation Restrictions, commonly known as development rights. It is a voluntary program whereby farmland owners apply to the Department of Food and Agriculture to sell a restriction on all or a portion of their property. After field inspections, a screening and selection process, appraisals, and approval by the Agricultural Lands Preservation Committee, the Commonwealth acquires deed restrictions, which run in perpetuity, and prohibit all activities that would destroy or impair the land for farming. Title to the land still rests with the landowner who enjoys all the traditional rights of the property ownership, such as the right to privacy, the right to lease or sell the land, and of course the right to farm the land.

Since the program inception, more than 25,837 acres have been protected statewide, with an additional 14,915 acres currently in process. During the past six years the Legislature appropriated five million dollars for each of the first four years twenty million dollars in 1983, and another five million in 1984 for a total of $45 million to fund the program and $35 million in 1987 for a total $80 million.

An active farmland preservation role by the Department of Food and Agriculture came none-too-soon for Massachusetts, as over a million and a half acres of land in farms have gone out of production in the state since World War II. During the two decades between 1951 and 1971 it has been estimated that between 11,000 and 12,000 acres of farmland were lost annually in the state because of urban conversion. One has only to drive around the countryside to witness new houses going up in fields and orchards that were recently in active agricultural production.

The loss of agricultural land in most areas of Massachusetts will probably continue because the economic incentive to sell the farm for non-agricultural uses is often too tempting for a farmer to resist, or the land is simply just to expensive for the farmer's children or neighboring farmers to purchase. It is this disparity in land value for development versus agriculture that makes the Commonwealth's Agricultural Preservation Restriction (APR) Program work.

Status of Farms Protected

All of the farms that are currently in the APR program are checked from time to time for compliance with the terms of the Preservation Restriction. At this time, all of the land currently protected remains in agricultural use.

Approximately 60 percent of the farms are in dairy production, thirty five percent are produce farms including fruits and vegetables, and approximately five percent are "other," including general livestock, flowers, etc.

Approximately 30 percent of the farms have been sold since the restriction was granted, many of which were conveyed within the family. They all remain active agricultural production.

Proceeds from sale of the development rights were used primarily for retirement. The second highest use of the funds was for debt reduction or pay-off, and the remainder was used for improvements to the farm.

In the past seven years, the APR program has placed development restrictions on a total of 275 farms covering 25,837 acres of farmland. These farms range in size from a fifteen-acre highly intensive market garden to 340-plus-acre dairy operations. Included among these farms are apple and peach orchards, specialized vegetable farms, small fruit operations, general forage crop and livestock farms, farms producing field crops such as potatoes, cucumbers and grain corn, and diversified dairy farms. The types of farms in the Massachusetts program are an excellent cross-section of the types of food-producing agricultural enterprises in the State.

The additional funding provided under the 1988 Open Space Bill will enable APR Program staff to respond to a steady and increasing stream of applicants. Numerous APR agreements have already been completed while dozens more have been in various stages of application and approval, pending the recent passage of the bill. Forty three applications involving 4,717 acres were under purchase-and-sale agreement of Jan 1, 1989, but could not be completed before the new infusion of funds.

Eighty four additional farm on 9,333 acres have been under active appraisal, while 26 applications involving 1,467 acres have been on standby.

APR staff members predict that as the number of applications continues to increase, program applicants will be more closely scrutinized to assure their compatibility with program objectives. While awaiting the infusion of new funds, the APR staff has sought to elucidate and develop those objectives. One of the program's major objectives is to continue to add more restricted land in the vicinity of those farms already protected, in order to secure large areas of land for agricultural production. More and more landowners are becoming familiar with the program, and the assemblage of large blocks of protected farmland is underway in a number of towns, including Westport, Dudley, Hadley, Amherst, and others. Other program objectives include: suitability and productivity of the land for agriculture; the imminence of threat to the farmland; the economic viability of the farm; and the availability of creative financing approaches that will reduce the cost to the Commonwealth.

Cost saving financing techniques likely to receive even closer consideration by the APR staff and the ALPC in the coming year, include the following.

(1) **Land banking by the owner** - The owner is willing to hold out substantial acreage which is not essential to the farming unit, for possible liquidation. By doing so, the Owner is "land banking" acreage for family residential use or sale which will reduce the cost of the APR.

(2) **Compatible Development** - Where a town or land trust purchases the land outright, it may be necessary or desirable to remove some of the marginal agricultural land for limited residential development in order to offset the cost of purchase.

(3) **Substantial Local Contribution** - Farms of high value will be expected to have a substantial local contribution. Normally this will come from the town through town meeting appropriation or from the Conservation Fund of the Conservation Commission or from local non-profit organizations.

(4) **Cooperative Funding** - Contributions, made by another state agency that has an interest in the preservation of an APR farm can help to reduce the cost of the APR for the DFA.

(5) **Bargain Sale** - Where the appraised value of the development rights is higher than the Commonwealth is willing to pay, the owner may be willing to sell the development rights for less and take the difference as a charitable deduction for federal tax purposes.

State-owned Farmland Project

The State-owned Farmland Project has been making publicly-owned agricultural land available for use by Massachusetts farmers and agricultural schools for the past twelve years. The lands involved include parcels formerly farmed by the state's large mental health, public health, and mental retardation schools and hospitals. These institutional farms closed in the 1960's and '70's.

Farmland at Danvers, Northampton, and Foxborough State Hospitals was transferred to DFA and is protected in perpetuity as environmental land under Article 97 of the Massachusetts Constitution. Lands at other hospitals are made temporarily available to DFA for the leasing program but are not protected resources.

DFA is also managing agricultural leasing for the MDC on several fields in the Ware River and Wachusett Reservoir Watersheds. Maintaining open lands in agricultural use helps to increase water yields in the state's reservoir system.

Statistics on the State-owned Farmland Project are presented in the table on the previous page.

Massachusetts Farmlands Stewardship: In 1989, DFA refiled legislation to increase its leasing authorization from the state maximum of five years with one renewal to thirty years with a renewal for twenty years. This legislation will formally establish the Mass. Farmlands Stewardship Program in DFA and allow farmers long-term access to public land.

This long-term tenure will make it possible for new-entry farmers to secure start-up loans for their enterprises without the heavy burden of purchasing land and will also allow for investment in long-term conservation practices on the land. The current state fiscal crisis has prevented legislative action on this and many other bills, but DFA will continue to pursue its passage in 1990.

Executive Order #193: The only protection afforded state-owned farmland that is not controlled by EOEA agencies is Executive Order 193. Signed in 1981 by the King Administration, EO 193 targets both conversion of state-owned farmland and use of state funds to develop privately-owned agricultural land or land with Prime or Important agricultural soils. EO 193 does not actually prevent development but, rather, directs state agencies to seek alternative sites and to "mitigate against conversion".

Intensive prison overcrowding at both the state and county levels has resulted in the conversion of farmland to prison space in several areas across the state. In some cases, EO 193 has been adhered to and prisons sited where they will have the least impact on agricultural land. In other cases, prisons have had a 100% impact on farmland with little or no mitigation. Both MEPA and the Conservation Law Foundation are concerned about this situation and private individuals have filed a bill to give EO 193 the force of law.

In other cases, where EO 193 has been considered in the design phases of a project, DFA has had good success with EO 193. The Massachusetts Housing Finance Agency has been particularly cooperative. The MHFA application forms for SHARP and HOP funding include a question on the applicability of EO 193 to the site in question. DFA frequently checks sites for MHFA and has successfully negotiated mitigating measures with several proponents.

Land Leased Under State-Owned Farmland Project

LEASED TO INSTITUTIONS:

LOCATION	CONTROLLING AGENCY	LEASING INSTITUTION	ACRES AGRICULTURAL	ACRES WOODS
Danvers	Food & Ag.	Essex Ag. & Tech.	7.4	
Foxborough	Food & Ag.	Foxb. Cons. Comm.	24.8	32.8
Northampton	Food & Ag.	Smith Vo-Ag H.S.	163.6	112.1
		TOTAL ACRES:	195.8	144.9

LEASED TO PRIVATE FARMERS:

LOCATION	CONTROLLING AGENCY	ANNUAL RENT ($)	ACRES	USE
Barre	MDC	11.00	11.0	hay
Clinton/Sterling	MDC	services	22.3	sm gr/hay
Danvers	Food & Ag.	5,535.60	197.7	corn/hay
Grafton	DCPO	308.00	7.8	hay
Grafton	DCPO	168.00	6.0	hay
Hubbardston	MDC	308.00	30.8	hay
Hubbardston	MDC	115.20	9.6	hay
Lakeville	Mental Health	1,479.00	49.3	corn/hay
Lancaster	DCPO	124.00	24.8	hay
Middleborough	Mental Health	1,764.00	14.0	strawb.
Tewksbury	Public Health	2,980.00	119.2	sw corn
Tewksbury	Public Health	109.10	109.1	hay
Westfield	Public Health	662.00	26.5	veg.
Westfield	Public Health	935.00	17.0	veg.
	TOTALS:	$ 14,498.90	645.1 acres	

AVERAGE RENTAL FEE: $ 22.48 /acre/year

TOTAL ACREAGE LEASED BY PROJECT: 985.8 (840.9 AG./ 144.9 WOODS)

Bureau of Markets

Janet Christensen, Chief

In tight economic times, our Bureau, like the farmers it serves, has been attempting to keep costs at a minimum yet maximize returns.

Our modus operandi has been making the most of our talent at hand, and our staff is well versed in turning a buck and making a big splash from a small budget. Each marketing specialist covers an assigned region of the state, but also specializes statewide in one or more subject matter areas, e.g. farmers' markets, green industry, supermarkets, farmstands, specialty foods, institutional sales, food processing etc.

In recent years, our "Massachusetts grown and fresher" campaign has traveled far and wide, and we are pleased to see the use of the logo expanding across the state. With produce growing in popularity each year, we see a greater awareness by Massachusetts consumers of the quality and freshness of local food products as well as Massachusetts flowers and plants.

We are also promoting the use of a "Massachusetts produced" logo for poultry products, and the use of "Massachusetts processed" or "Made in Massachusetts" labeling for other Bay State food and agricultural products.

There are many marketing programs and projects underway during each season of the year, and an extensive calendar of promotional events. An overview follows.

Green Industry

A highlight of the year was the Bureau's exhibit at the New England Flower Show, which awarded us a blue ribbon, the coveted Worcester Horticultural Society silver medal for best educational exhibit, and another educational certificate.

Massachusetts has one of the largest greenhouse industries in the nation. We continue to work closely with industry through participation in regular meetings held by the Massachusetts Green Industry Council and the Massachusetts Flower Growers' Association.

We assisted in the design and planning of the Flower Growers' Association's exhibit at the Eastern States Exposition as well as with many other promotions including the sale of Poinsettia banners.

We supported the efforts of the Green Industry Council through a grant for a Career Video Tape that will be utilized as an informational tool encompassing representatives of the entire Green Industry to those interested in entering the field.

The staff member working with these groups in 1989 was Mary Moffitt.

Food Buyers Guide, Market News and Crop Reports

For the purpose of compiling accurate prices statewide, the state is divided into three areas: Boston and vicinity, central and western Massachusetts. Prices are recorded for a selection of produce, meat, dairy and fish products from approximately 4 to 5 stores in each area.

Prices quoted are collected for each product and tabulated by range: highest to lowest as well as the most prevalent price for each product.

The Food Buyers' Guide format has changed somewhat in the past year. In the fall and winter months, reports are printed once a month with only prices from supermarkets and roadside stands offering local produce such as winter squash and cider. During the late spring and summer

months, prices are recorded on local products from supermarkets, roadside farmstands and farmers' markets.

The cover page of the Food Buyers' Guide features a specific food product with information and recipes that would be of interest to those farmers that deal with consumers.

The Food Buyers' Guide is mailed to food editors, growers, farmers' market masters, economists, government statistical agencies and County Extension Services.

The guide is a good source of information for those that sell to these markets as well as a source for comparison of prices in different areas of the state.

The Department also cooperates with the USDA Fruit and Vegetable Market News office to provide daily wholesale price information during the local growing season with tape recorded information for which growers can dial a special number.

The Bureau of markets publishes an Ornamental Crop Report in cooperation with the USDA Market News Office in Chelsea. Wholesale flower prices are recorded from the Boston wholesale flower market and a weekly ornamental report that is prepared. Information is transmitted to the USDA by utilizing a computer network system and the TELE-MAIL System.

The mailing list circulation has increased this past year with continued interest in the prices reflected at the Boston Wholesale Flower Market in comparison to the entire floral marketing industry.

Our continued participation and contacts with the wholesalers at the Boston Wholesale Flower Market has helped to provide local growers the names of those wholesalers interested in selling local flowers.

Mary Moffitt is the staff member working on these projects.

Supermarkets

We continue to promote local farm and food products to area supermarkets through "point-of-purchase" materials and by periodic visits with supermarket buyers.

With the fine assistance of the Bureau, the Department's promotional advisory committee hosted the fifth annual "Fine Foods Dinner" to extend appreciation to supermarket buyers for their support and interest in purchasing local products. Representatives of the media and all of the commodity groups and their Buyers were also invited to the annual event, held this year at the Publick House in Sturbridge.

"Supermarket Week", held the third week of August, was celebrated with promotional material displayed in many supermarket produce aisles with the colorful reminder to "Take Home A Taste of Massachusetts."

The Department's market specialists avail themselves to supermarket buyers to provide assistance in product demonstrations, consumer information as well as product-grower referral.

Roadside Farm Stands

The Bureau of Markets continues to pool its efforts with the Massachusetts Association of Roadside Stands (MARS). The Bureau assists MARS in editing their newsletter "FarmstandNews," which features marketing issues and MARS business and in planning direct marketing conferences.

Market Specialist Doug Roberts works closely with MARS on these cooperative efforts.

The Fresh Connection

The "Fresh Connection" project is designed to help local growers find direct markets and to improve the communication among local growers, food processors, restaurant chefs, and the food service industry. Highlights of 1989 included farm tours and participation in trade shows as well as the newsletter which was publishedseasonally and sent to some 600 restaurateurs, growers, food processors and media.

The Bureau of Markets coordinated participation in several trade shows throughout the year to foster direct marketing. Commodity groups participated in the March 1989 Northeast Food Service and Lodging Exposition, attended by some 10,000 industry buyers and the Fine Foods Show held in Randolph. These producers gained

increased exposure for their products and geverated business.

Bonita Oehlke coordinates the Fresh Connection program.

Farmers' Markets

Farmers' Markets in Massachusetts are direct marketing and economic opportunity for family farmers and market gardeners across the Commonwealth.

Each year farmers' markets experience growth by an addition of several new markets. This is achieved with the assistance and cooperation of cities and towns chambers of commerce, mayors' offices, development corporations, University of Massachusetts Extension Service, state granges, conservation commissions, Massachusetts Federation of Farmers' Markets, and USDA Food and Nutrition Service, just to mention a few agencies and groups.

Farmers' Markets assure that the revenue remains in the state. There are more than seventy farmers' markets which generate over four million dollars worth of revenue, and provide economic opportunity to more than six hundred Massachusetts farmers.

Farmers' markets are all unique. They vary in size, the number of farmers who serve them and their consumer base. They are located in shopping malls, city parks, near historic landmarks. They bring activity and beauty to otherwise barren plazas and parking lots. In addition, they link the city to the farm, and are an excellent representation of the variety of Massachusetts' farm products to the consumers, who may not be aware of local agriculture. Farmers' markets not only present an excellent direct marketing aopportunity but also provide indirect publicity for individual pick-your-own operations and farmstands due to visibility at the market sites.

Copley Square farmers' market was re-established 1989, on the newly refurbished Copley Square Park along St. James Street. The Department of Food and Agriculture and the Boston Parks and Recreation Department co-sponsor the market.

A directory of farmers' markets, published by the Department annually, is mailed to farmers in March along with a recruitment questionnaire.

The staff member heading up this area of work is Anneli Johnson, and marketing specialists assist in their regions.

Farmers' Market Coupon Program

The Massachusetts Farmers' Market Coupon Program introduces low-income Bay State citizens to fresh fruits and vegetables, cider and honey by providing $10 worth of coupons each to eligible mothers and children redeemable at 55 authorized Massachusetts farmers' markets. In Boston and Lowell, coupons are also accepted at special "farmstands" that are organized and operated by residents at housing sites and community centers in cooperation with the Boston Food Bank.

Each year some 56,000 persons, including 40,000 mothers children and 16,000 elders benefit from Farmers' Market Coupons. Coupons are also issued to selected homeless shelters and to other programs for the needy across the state. In 1989, 179 farmers participated in the program, and the number may exceed 200 in 1990.

1989 also marked the first year of the national Farmers' Market Coupon Demonstration Program, a three-year pilot project, funded by the Food and Nutrition Service of the USDA.

The Massachusetts Department of Food and Agriculture, under the leadership of Commissioner August Schumacher, Jr., initiated the project in 1986 as a promotional initiative designed to introduce pregnant women, young children, seniors, and others at nutritional risk to the benefits of fresh, locally-grown produce. At the same time, the program expands the customer base for the farmers. By limiting the program primarily to native produce, Massachusetts farms are supported.

The Coupon Program is co-sponsored by the state Department of Food and Agriculture, WIC and the Division of Elderly Health, both at the state Department of Health, the Expanded Food and Nutrition Education Program (EFNEP)of the Cooperative Extension Service and the Massachusetts Federation of Farmers' Markets.

Bonita Oehlke oversees this program.

Foreign Trade

Mary Beth Guilfoyle, Foreign Trade Specialist

Over 450 commercial exhibitors explored the world of overseas export at the fourth biennial National Food and Agricultural Exposition, held at Boston's Hynes Convention Center, May 15-17, 1989. The exposition is sponsored by the National Association of State Departments of Agriculture (NASDA). Previous shows were held in Atlanta, Kansas City, and Seattle.

As host state for the event, Massachusetts had thirty-four companies in attendance at the NASDA expo, over half of them new to the show. Products represented included vegetable oils, beer, crackers, apples, juices, bean sprouts, yogurt, cereals, coffee, cultivated trout, processed shrimp and baked goods.

For some Massachusetts exhibitors, it was their first trade show. It was a valuable experience for them in terms of learning how to deal with buyers and the economics of selling foods overseas.

A "Taste of the States" reception on the first night of the show drew over 1,800 guests. The reception was planned with the assistance of the Massachusetts Department of Food and Agriculture. Representative foods from all over the United States were sampled by buyers and other guests.

Buyers were also introduced to new products through displays at the Hynes Convention Center entrances. The Eastern United States Agriculture and Food Export Council (EUSAFEC) and each of the sister cooperator organizations had their own displays of new products, with information on where buyers could find the products on the exposition floor.

According to NASDA, 55 percent of the exhibitors were new to the show in 1989. Ten percent of the exhibitors made sales at the show, and half were confident that they would sell as a result of the contacts they made there. Company representatives reported an average of eighteen trade contacts per exhibitor.

NASDA reported that 952 buyers attended the Boston show. This year saw a higher percentage of no-shows. NASDA planned to do a special mailing with a questionnaire to find out why those who had committed themselves did not come. The greatest success in recruiting buyers was in those countries where someone was specifically organizing a tour group and making travel arrangements for the show.

The USDA Foreign Agricultural Service (FAS) was extremely pleased with the buyers who attended and the countries they represented. They termed the buyers "a select group of food buyers", and claimed that those exhibitors who were experienced in export sales recognized the high quality of the buyers present, especially from Asia and the Middle East.

For their part, the buyers gave the NASDA show high marks. A buyers group from the Netherlands who had attended another show prior to NASDA told FAS staff that NASDA was the show with the new products.

The next show is scheduled for Las Vegas in 1991. Several participants stressed the need for a permanent location for the show, perhaps in New York, to follow the lead of the SIAL and ANUGA shows in Europe, which are always held in Paris and Cologne, respectively. One representative suggested two permanent sites, one on each coast, to cater to both Pacific-rim and European buyers. The sites could run concurrently or on alternate years.

DIVISION OF ANIMAL HEALTH

Mabel Owen, Director

Sections 1 through 49 of Chapter 129, and certain sections of Chapter 128 of the Massachusetts General Laws provide the jurisdiction under which the Division of Animal Health, Department of Food and Agriculture, operates. Using a series of vaccinations, serological and environmental tests, sale, barn and auction surveillance and other diagnostic procedures, the division goal is the prevention, control and/or eradication of an ever-increasing number of domestic animal diseases. Although Massachusetts has lost a number of farming operations within the past several years, livestock production goes on, on fairly well-stabilized numbers of farms. Some 120,000 cattle, including both dairy and beef breeds, well over 50,000 swine, some 35,000 horses and ponies, 25,000 sheep and goats, and well over a million hens and turkeys comprise a healthy livestock industry. Within the past decade, the dollar valuation of this animal population has risen rapidly. Cow prices are higher than ever, as are those for all other livestock species. Purebred animals are in the ascendancy as farmers seek to make improved use of their land and their labor. The average milk production, in dairy herds, has increased almost twenty percent over the past decade, as has the return in other areas. New England land is valued highly, and the growing and grazing season is short.

Current labor costs, as well as various marketing and residue- avoidance strictures pressure the farmer into selling his land for development. Almost the only areas left to him for a profit margin are disease prevention and control. Within the decade, Massachusetts has attained "FREE" status in Tuberculosis, Brucellosis, and Pullorum-Typhoid. Free status not only increases the value of our livestock for export, but removes the direct expense of many tests.

Once a state or area becomes disease-free, there is always the temptation to rest upon those laurels. Past experience, many of them, point up the error of this thinking. The northeast was free of bovine brucellosis many years ago - and gave up vaccinating and testing. The disease reappeared in the 60's and cost the farmers of Massachusetts many millions of dollars - and thousands of cows - to eradicate once again. The price of disease freedom is unremitting vigilance - on the part of veterinarians, farmers, dealers, breeders and every regulatory agency there is - state and federal.

Budgeting problems in the Division of Animal Health began at the end of fy 1986 - with two empty field positions and two fewer state cars than necessary. The problem has exacerbated; at the end of fy 1988 the number of empty and/or lost positions rose, as did the state car shortage. By the end of fy 1989 the situation had worsened. For an entire year, both the Worcester County State Veterinarian slot and that of Supervisor of Riding Academies went unfilled, as did two poultry products inspector positions and one in the office staff. Car shortages continued. One Animal Inspector has been without a state car for almost two full years. Adjusting such losses from the $ .22 private mileage account is not feasible, nor does it allow us to make the most cost-effective uses of field personnel.

The basic duties of the people who are employed in the Division of Animal Health are mandated by law. These services are also within the expectations of the livestock industry of Massachusetts. Regrettably, the longer disease prevention is neglected, the more certain is its return to the flocks and herds in Massachusetts.

The Tuberculosis Program

Massachusetts cattle are tested at state expense on a full-herd basis, once in three years. Each test requires two visits, one to inject and a second to read, and each is

essentially an allergic-reaction test, similar to the one used for people. Maintaining the state's "Accredited Free" status requires that more than 90% of its cows be on a satisfactory surveillance program, including regular carcass inspection for TB lesions at all slaughter plants. Although a few animals react to the Tuberculin test, and must be re-tested against the avian type, only one cow failed to be cleared, on the comparative-cervical test during fy 1989. This animal cultured negative at slaughter and a federal indemnity payment was made. Although human tuberculosis cases continue to be found, all are either inner-city or of foreign derivation. No cases traceable to milk have been found in the entire country for close to a decade.

The Brucellosis Program in Cattle

The end of fy 1989 marks the 74th month that Massachusetts has been rated "FREE" of bovine brucellosis. This rating is shared by 29 other states. The country as a whole has made dramatic progress in the elimination of this disease. Only one state now has a "C" area and there are now less than 2,400 known-infected herds in the country. Almost all of these are in the southern and western, essentially beef producing, states. The accelerated eradication federal program is now in its second year and appears successful. The country as a whole is nearer brucellosis eradication than it ever has been. Nationwide, industry cooperation has been prominent.

In Massachusetts, at this time, the Brucellosis Ring Test (BRT) is our primary surveillance procedure. With USDA-APHIS help, quarterly milk pick-ups are made and the test itself conducted at the Paige Laboratory on the University of Massachusetts' Amherst campus. With partial financial aid from the Division of Animal Health, Veterinary Services at Paige Laboratory has been able to computerize this Program, providing a far more efficient check-back on producing herds. Positive BRT tests provide for tracebacks and, full herd blood tests. Almost all reveal vaccination-titered animals, most of which clear as their lactation period proceeds.

Calfhood vaccination (811 female calves between the ages of four and eight months) continues to be available, by law, at state expense. Re-testing of all imported cattle is also a surveillance procedure as is the requirement that all breeding cattle (except for young vaccinated heifers) come in on a negative blood test. Since Massachusetts is a heavy importing state, this precaution remains necessary as long as brucellosis is endemic in any part of the country. Today animals often travel thousands of miles, from birth to raising to breeding to slaughter. As long indemnities cannot be paid, risks of disease importation cannot be taken.

Swine brucellosis

At the end of fy 1989, there had not been any known infected swine herds in Massachusetts. Application was made for Validated Status in Swine Brucellosis and a reply is expected before the end of the federal fiscal year in September. With current personnel losses, especially for the Veterinary Health Officer position in heavily-animal populated Worcester County, it is certain that the state cannot maintain Validation Status via whole-herd testing alone. Our request for status is based on a combination of first-point testing, slaughter plant testing and traceback and a percentage of whole herd tests. It is expected to receive federal acceptance. In the event that Validation Status is attained, as of July 1, 1989, it will mark the successful end of a very long effort - by the division, by its federal counterpart and by the state's swine breeders.

Other Swine Diseases

The concern of swine breeders over unnecessary losses, and large number of industry meetings, nationwide, in the mid-eighties resulted in federal support for a program to eliminate Swine Pseudorabies Virus (SPRV) from the country's pork-producing states. This program has very limited federal monetary support, but does have the entire industry behind it. Massachusetts, in fy 1988 joined other states in the northeast in a serology survey of its swine breeding herds. Eleven herds were found to have one or more sero-positive animals. Five herds were cleaned up almost immediately with four of the remaining six reaching clean status in fy 1989. One of these was heavily infected and was also incurring heavy losses. This herd was tested-free near the end of fy 1989, and remains under strict surveillance. The Division and the hard-working owner, deserve praise for progress with this herd. One other very large herd is expected to be under plan by very early fy 1990. Massachusetts is fortunate that its

swine herds are widely separate, with no apparent cross-infection occurring. The state should be eligible for PRV-FREE status at or near the end of fy 1990.

Serious threats always exist with other notorious swine diseases. Among them: African Swine Disease, Hog Cholera and Foot and Mouth Disease. All of these are endemic in Europe or closer - and international travel is now almost totally lacking surveillance. The Division of Animal Health annually takes part in READEO (Regional Emergency Animal Disease Eradication Organization) exercises which are part of state-federal emergency planning in the event of an exotic disease outbreak.

Pet Shop Licensing

State licensing of Pet Shops (293 in fy 1989) is designed to provide the animal sold with proper care, and a purchasing public with a more reasonable sale contract. A requirement that puppies and kittens be no less than 8 weeks of age when sold, and be provided with regular veterinary inspection does help, but it should not be forgotten, by the buyer, that these are baby animals, already heavily traumatized by weaning and shipment. The new sale regulations have helped materially in reducing the number of consumer complaints concerning these sales. The Division of Animal Health sought to inspect each licensed shop at least twice a year. A 95% completion of this program in fy 1988 was not repeated in fy 1989 because of heavy field staff reduction. A similar reduction in inspection reports received by the two humane agencies given the major inspecting work-load in this area makes it certain that, both in fy 1989 and certainly in fy 1990, Pet Shop inspections will not be adequate to protect the animals sold in such establishments. Although less than 20% of the licensed shops offer puppies for sale on a regular basis, other animals and birds are sold in large numbers. Pet animals provide companionship and a sense of responsibility for many people, young and old alike, but training in their care, as well as a basic understanding of their needs is taught in few schools, by few agencies.

Equine Programs

Although few licensing programs are financially profitable to the agency under whose laws they appear, the licensing of Horseback Riding Instructors, Riding Schools and Equine Dealers is one. Despite an income to the state of $30,884.00 in fy 1989, the position of Inspector of Riding Academies has been unfilled for the entire fiscal year. These programs have had excellent industry support and fee losses have not been great, but keeping these licenses available to the consuming public is beyond the technical capability of the clerical staff of the Division of Animal Health. No one, on that staff, has the specialized knowledge required to mandate this highly technical licensing situation. The Division of Animal Health strongly recommends that, if the above position cannot be filled very early in fy 1990, the applicable section of Chapter 128 and 129, covering licensure, be rescinded. It is remiss of any governing agency to require, by law, any licensing program that is not or cannot be applied with legal propriety. These licenses were devised to provide both animal and consumer protection and they have worked very well since the laws were passed in 1972 and later, but there is no provision, in the Division of Animal Health, to continue this licensing without filling the Supervisory position.

Equine Infectious Anemia

The past two-years have seen an increase in both the number of and severity of outbreaks of Swamp Fever, or Equine Infectious Anemia (EIA) in the northeast. Large losses have occurred, and the disease itself has been manifest in the clinical stage, rather than in the inapparent carrier. No such outbreaks have occurred in Massachusetts, whose testing laws have been in effect since the early 1970's. More than 16,000 horses, and ponies are tested each year in this state, with an average of 8-10 positives. With the incidence of disease so low, it would be easy to become complacent and not value the test for its excellent protection against loss. A negative test should accompany the purchase of every horse or pony, and be subject to retest in 30 days. The prevalence of this disease in the deep South and Gulf states, together with the high prices any equine bring in New England has resulted in a lucrative market for illegally imported and untested animals. Don't support it.

Special Canine Programs

The licensing of Guard Dog businesses has been in effect for six years. Designed to provide humane care, training and handling for guard, sentry and "personal protection" dogs, these facilities are regularly inspected by certain humane agencies (MSPCA AND ARL-Boston) as well as field professionals in the Division of Animal Health. This inspection program will also cease at the end of 1989 because of staffing losses. Hearing Ear Dog training and sales kennels were placed under licensing requirement four years ago. The Division has never received permission to seek and hire an experienced supervisor for this program with the result that Rules and Regulations have not been promulgated, nor licensing provided. The only kennel currently on the Hearing Ear Dog Business list is operated in close association with MSPCA, under whom it would be inspected if licensed.

Rabies Control

Hospitals and Physicians are required by law to report to local health agencies all bite cases. These result in a ten-day (or longer) quarantine period for the biting animal, if its identity and location are known. Rabies in the human is almost invariably fatal and the presence of a vaccinated dog and cat population between a vulnerable populace and rabies in wild animals, is the only true protection against it. Testing of certain suspect animals is available from the Massachusetts Department of Public Health (617-721-2686) as is information concerning HDC (Human Diploid Cell) vaccines for persons who have been exposed to the disease or whose work or travel makes such protection important. (note: Persons traveling in Africa and certain other areas are advised to consider this vaccination prior to departure.)

Poultry Program

Surveillance procedures against Avian Influenza continued through fy 1989. If no cases of this important poultry disease occur in the first half of fy 1990, the requirement for show-bird-testing will be rescinded as of January 1, 1990. This plan depends upon the agreement and participation of other states in the Northeast. The Division of Animal Health and the entire poultry industry are grateful to the Poultry-show people for their cooperation and participation in the testing program. Successful eradication of Avian Influenza was possible because segments of the poultry industry cooperated, for a disease control program whose failure could mean the loss of the poultry world as we know it.

Egg producers, reeling under adverse publicity raised over the cholesterol content of eggs, received a second blow over the alleged presence of Salmonella enteriditis in table eggs. Responding, as always, to public inquiry, Massachusetts conducted a large number of table-egg tests in fy 1988, finding no positives among the state's many egg producing flocks. With little known concerning the transmission of this disease within the flock, and tests which are less than desirably genitive or definitive, programs to eradicate this particular Salmonella-type have been slow to develop. Since large, nearby consuming states have indicated that they will adapt restrictive importing laws sometime in calendar 1990, many meetings have already been held to facilitate area cooperation in the eradication or control of this disease. It causes morbidity and perhaps mortality among many persons who are, by virtue of age, organ transplant, cancer therapy or specific disease status, immune-suppressed.

With the personnel shortage in the poultry section, a considerable amount of store-egg inspection is no longer being done. Since the present poultry section, formerly a self-standing division of twelve inspectors, a clerk and a Supervisor, is now a section of six (with two unfilled positions), it should be realized that very little inspection work can be done. Large sections of the state, notably the southeastern counties, have been totally uninspected for two or more years.

Shows, Fairs, Special Activities

Fy 1989 will be, because of a divisional lack of both personnel and funding, the last year that livestock, at shows and fairs - were state-inspected. We have been justifiably proud of our accomplishments in this regard, and of the complete cooperation we have always received from exhibitors and fair managers alike. A fair is often the only place urban dwellers can see a farm animal, the only contact they have with food animals. It has been our pride to see the best of the animals that are raised in Massachusetts shown and exhibited so very well.

Pulling Animals

As above, fy 1989 marked the end of our blood-testing (for forbidden drugs) of pulling animals at shows and fairs. Although tests have not indicated such abuse, the presence of veterinary animal health officers at these contests certainly had to have been a deterrent. Since such surveillance is still being carried out in neighboring states, it will be a sad commentary if Massachusetts becomes known as the one area state without adequate policing.

Sales/Auctions

Massachusetts, thanks to its central location, an excellent interstate system and good stabling facilities, continues to maintain its number-one status, for livestock sales in the Northeast. Specialized sales for purebred cattle, swine, sheep and horses make up an important section of our livestock economy. The food animal sales tax exemption applies.

Sheep & Goats

Sales of specialized cheeses made from both goat and sheep milk have been increasing, as have the herd numbers of both of these important small animals. The largest goat show in the northeast was held in Massachusetts, with entries close to the 300 mark.

Specialties

Inquiries for specialized animal products continue to increase. Interest in venison has prompted the importation of both sika and fallow deer. The number of llamas and other camelid herds has risen sharply, as has the breeding of donkeys, vicunas, exotic birds and large segments of marine agriculture, both scale-fish and shell fish. Changes in livestock agriculture have become the rule, rather than the exception. A consuming populace which can afford specialty- pricing, and one which is concerned with perceived levels of nutrition, cholesterol values and residue-freedom appears responsible.

Diagnostics

The lack of long-range planning in the area of animal disease diagnostics continues to provide the "unexploded bomb' of disease prevention. The Division of Animal Health funds a very small contract ($24,000) with the Veterinary Sciences Department of Paige Laboratory on the University of Massachusetts Amherst Campus. This, together with another contract Veterinary Sciences has from USDA-APHIS for brucellosis and pseudorabies testing, comprises the only diagnostic capability available to the division. As an active disease/control prevention measure, this is not enough. Instant diagnosis is the first step toward both control and eradication, and emphasis must be on "instant." Animals move hundreds of miles in a day; disease travels with them, at the same rate. A good testing/surveillance diagnostic laboratory is a must. Massachusetts is the only state with a measurable livestock economy without one.

DIVISION OF EQUINE PROGRAMS

Peter Bundy, Director

Thoroughbred Breeding Program

Calendar year 1989 was a disappointing time for the Massachusetts thoroughbred breeding industry. Suffolk Downs, the chief racing facility closed its doors as of December 31, 1989. This meant that thoroughbred racing in Massachusetts was limited to twenty days of racing at agricultural fairs.

With no immediate prospects of a renewal of major-league racing, many breeders were forced to curtail activities in the breeding sheds and racing development areas. Some breeders moved business to other states with sound incentive programs, a few shut down completely. However, a dedicated core of breeders remained in operation, with eyes toward new racing centers being built in the Commonwealth, from which they could derive funding for a new, forward-looking breeding program, and markets for their horse farming efforts.

The thoroughbred breeding industry in the past has contributed some $35 million to the Massachusetts economy, and maintained over 7,000 acres of farmland. Clearly, the breeding and raising of thoroughbred horses has been a significant factor in our state's economy, and a major contributor to the cause of open space preservation. Recognizing this, the Legislature in 1981 and 1985 passed into law, legislation for the funding of the Massachusetts Breeding Program from a percentage of the total handle at Suffolk Downs.

Breeder Awards: at Suffolk Downs and two agricultural fairs, Thoroughbred breeders received $376,976 in 1989. A breeder is the owner of a mare at the time of her foaling. If certain requirements are met, the breeder becomes eligible to receive breeder incentive awards of 25 percent of the purse won in first, second and third place finishes at licensed pari-mutuel race tracks in Massachusetts.

Owner Awards: owners of Massachusetts thoroughbreds received $278,960 in incentive awards during 1989. The owner of a Massachusetts-bred horse is the person who owns the horse at the time of its racing. Owners are awarded 20 percent of purses won in first, second and third place finishes at licensed tracks. Owner awards are paid only in open competition. No owner awards are paid for horses running in races restricted to Massachusetts-bred entrants.

Stallion Owner Awards: owners of registered Massachusetts stallions received $129,373 in stallion awards in 1989. Stallion owner incentive awards of 15 percent of purses won are paid to owners of thoroughbred stallions standing in Massachusetts and registered with this Department that sire foals that finish first, second and third in races at licensed tracks. The owner of the stallion at the time of service to the dam of such a finisher is the recipient.

State Racing Program: due to lack of available funds, stake races restricted to Massachusetts-bred horses were very limited in 1989. Two stakes were run, one for older horses and a Futurity for two year olds. Suffolk Downs provided funding of 30,000 for these races.

General Information: in 1989 Massachusetts registered thoroughbreds went postward 1672 times at Suffolk Downs and the fairs. These starters accounted for 227 wins, 219 seconds and 234 thirds. Stallion owners reported 263 mares bred in 1989.

Greyhound Breeding Program

Robert Bennett, Supervisor

The breeding of greyhound racing dogs in the Commonwealth continued to flourish in calendar year 1989. Registrations included 2,000 Massachusetts-bred racing dogs, 120 stud dogs, and 400 litters of new pups. Some of these will be available to enter races and provide needed entries for the greyhound racing industry which faces depletion of numbers due to the advent of racing in Kansas, Wisconsin, and Texas. These states have just had legislation passed to permit pari-mutuel dog racing. The Commonwealth receives over 30 million dollars annually from dog racing in Massachusetts.

Under Chapter 277 of the Acts and Resolves of 1986, breeders, owners, and stud dog owners received $212,759 in incentive awards from the Massachusetts Greyhound Breeding Program in 1989.

Standardbred Breeding Program

Although Foxboro raceway, the source of funding for the program is now closed, the Department has continued to register foals, stallions, take yearling nominations and collect sustaining payments. One day of racing was held at Greenfield Fair in September of 1989, thereby maintaining the program for Massachusetts and New England eligibles.

DIVISION OF FAIRS

Stephen Quinn, Director

The fairs program took a serious setback at the start of the fiscal year. One hundred thousand dollars was cut from the prize and promotional account. Prior to the reduction, the fairs had been notified that allotments would be increased and were encouraged to increase the amounts being awarded for prizes. The unfortunante turn in events meant a thirty percent reduction in prizes.

To reduce the negative impact on the industry, severe cuts were made to the larger and more financially stable fairs, including our two racing fairs. Hopefully, these reductions may be reversed, and thus preventing negative effects on the industry in the long run. Today, it is very expensive to exhibit animals on the show circuit. Whenever premiums are reduced or are not in line with costs, exhibitor numbers decline, possibly never to be as strong again.

With little time to adjust to previous reductions, the industry now must cope with reduce staff in the Division of Fairs caused by the Budget Reduction Act passed in January. This coupled with the Governor's worst case budget for FY91, further reducing the prizes another $200,000, has many organizations not certain as to their funding for fiscal year 1991.

Program Expenditure

The appropriation for fiscal year 1989 was $538,000. Monies were allotted in the following manner: $305,000 for prizes; $71,000 for exhibits and grants to agricultural youth programs; zero for rehabilitation; the balance for administrative purposes.

Fairs Rehabilitation

Due to the severe budget cuts, the Division of Fairs did not receive grants for the purpose of improving buildings and grounds at fair facilities within the State. Most facilities are in acceptable condition due to prior year grants. Hopefully, we will resume this much appreciated program if future funding allows it.

The Big E

Rain! The only word to describe the 1989 fair. Ten out of the twelve days it rained, reducing attendance to 800,902, down from the 1988 show by 211,641,

New exhibits included an excellent display of the two Sport Halls of fame in the State, Basketball and Volleyball. The greater Springfield Colleges had an excellent display which included information about eight local colleges including: American International College, Bay Path College, College of Our Lady of the Elms, Springfield College, Western New England College, Holyoke Community College, Springfield Technical Community College and Westfield State College. The John F. Kennedy Statue Fund Committee had an excellent exhibit and received a generous response from the fairgoers. The center area was again dedicated to "outdoor life in Massachusetts", including Smokey the Bear from the Division of Forests and Parks along with trout from the Division of Fisheries and Wildlife and two owls from the Division of Environmental Law.

The traditional exhibits from our various commodity groups rounded out the show with great displays from Mass. Dairy Industry, Farmers' Markets, Roadside Stands, Bee Keepers, Cheese, Christmas Trees, Cranber-

ry Growers, Flower Growers, Maple Producers and Tree Farm Industry.

We were also fortunate to have and exhibit from the Mass. State Police, the State Lottery, and live radio broadcasting from Station 640 A.M. WNNZ. Channel 40 broadcasted live news daily from our building highlighting many of our exhibits.

Workshops

Training sessions were conducted for fair inspectors and judges in dairy, fruits, vegetables and flowers. Meetings were conducted on the ox, horse and pony pulls. New guidelines were drafted and will be in effect for the 1991 fair season. The industry wishes to continue its high standards of performance. To alleviate perceived problems, the industry has suggested and approved some difficult changes to the current rules and regulations.

Wool Board

In 1989, the Division continued its involvement with the Massachusetts Wool Board. Pools were held to market collectively the various types of available wool. The Board sent wool to be manufactured into blankets and throws. With the decline of the textile industry in New England, it is becoming more difficult to produce our own woolen products.

The Star Scouring Plant located in Rhode Island has closed. The nearest scouring plant is located in Pennsylvania. The cost of shipping will be prohibited. Due to this cost, the association is looking for alternative activities to supplement blanket production in order to promote Mssachusetts woolen products.

DIVISION OF REGULATORY SERVICES

Paul F. Gosselin, Director

The year 1989 brought in a new fiscal reality which placed additional pressures on new initatives and maintaining adequate enforcement. Due to attrition and retirements, the Division personnel was down twenty percent by the beginning of FY90. However, these tough times brought out the best in those who remained in state service. Priorities were maintained, inspections schedules were met, investigations were conducted in a timely manner and, issuance of licenses and registrations were conducted efficiently. The flawless character and integrity of the staff in the Department deserve commendation.

Comings and Goings

As the Division continued to address the ever changing world around us, 1989 ushered in some notable internal changes. First and foremost, Lewis F. Wells retired after serving the citizens of the Commonwealth for over thirty years. Lew ran the Pesticide Bureau operations single handed for many years before becoming Division Director of Regulatory Services. He served as Acting Commissioner of the Department in 1985. Lew oversaw the development and evolution of the regulatory programs in the Division throughout the 1980's. His accomplishments over the years are too numerous to include in this volume. The Department will miss Lew's guidance and leadership.

Jeffrey L. Carlson left the Pesticide Bureau in April to become the Executive Director of the Cape Cod Cranberry Growers Association. Jeff began working in the Pesticide Bureau in its infancy and rose through the ranks to run the Bureau. During his tenure many innovative initiatives were begun and place Massachusetts in the forefront of pesticide management. Gail Kaprielian was appointed as the new Bureau Chief. Gail developed and oversaw the pesticide enforcement program.

James Cassidy retired from Bureau Chief of Farm Products. Jim had also served over thirty years in state service. George Porter was appointed as Bureau Chief. George has over twenty-five years of service in the Bureau of Farm Products.

Milk Marketing

Due to the instability of the price and supply of milk, Commissioner Schumacher issued an over-order price of $1.35/hundred weight in January. The Department conducted an investigation into the effect of the order during the fall. The findings of the investigation determined that the order was a necessary tool to maintain the stability of the milk supply and prices. After careful review and hearing, the order was extended in December.

Quality Control

Although the 1987 annual report highlighted the committment on the part of the University of Massachusetts to provide analytical services for the testing of seed, feed and fertilizer samples, due to a mandated budget reduction plan, the University plans to eliminate the Paige Laboratory in July 1990. The Department is working diligently to secure the necessary funds to maintain an adequate analytical services. The inspection, sampling and testing program for seed, feed and fertilizers is critical to ensure the quality of agricultural products sold in Massachusetts. If funds are not secured, Massachusetts could become the only state without a testing program.

BST

BST, a bovine growth hormone, is one of the first biotechnological innovations to be tested in agriculture. BST is a naturally occuring hormone produced by cows to produce milk. The introduction of synthetically produced BST into dairy cows is intended to increase the production of milk. Synthetically produced BST is currently being tested in dairy farms accoss the nation. The testing program is required to gain FDA approval. Controversy arose from the fact that the milk produced from these test animals is being allowed into the food supply. Commissioner Schumacher was one of the first agricultural officials in the nation to voice concern about the impact of BST on cows and consumer preference for 'naturally' produce milk.

Apiary Regulations

Regulations pertainiing to apiary inspections were amended in time for the migratory bee season. These regulations were necessary to address the spreading infestations of Varroa and Tracheal mites, especially after the federal government withdrew its proposed national policy. Additionally, a model agreement was reached between the Department and representatives from Maine on an inspection and permit program. Although there were some reports of violations and some technical violations, the Bureau of Plant Pest Control closely monitored the interstate transport of bees and minimized the spread of these deadly diseases.

2,4-D

After two long years, the State Individual Review of 2,4-D was completed in January. The recommendations that highly concentrated products be reclassified as restricted use, thus, taking these products out of homeowners hands and increasing worker safety protection measures were accepted.

Rights of Way Management

The first full year of implementation of the Rights of Way Management regulations was completed. The process of approving Vegetation Management Plans, Yearly Operation Plans, herbicides and a wetland impact study was completed.

Bureau of Dairying

Dave Sheldon, Chief

The Bureau of Dairying completed the 1989 Fiscal Year on solid footing. All of the requests received for the inspection of Dairy Farms and Milk Plants to ship fluid milk to our market were completed on a timely basis in accordance with Chapter 94 of the General Laws, which we operate under.

Massachusetts Dairy Farms

On July 5, 1989 our records revealed a total of 453 commercial dairy farms operating within the state. This number represents a drop of twenty nine farms from our July 1988 figure of 482 farms. This loss of farms is less than half of the loss in F.Y. 88 and although we are very concerned about our continuing loss of Massachusetts dairy farms, we are pleased to see that the decline is slowing considerably. In addition to the slowdown in the loss of farms we are seeing a comparative slowing of the slippage in the yearly total production of milk in Massachusetts. We expect that in F.Y. 90, Massachusetts milk production may well level out and hold at a fairly even keel.

Dairy Farm, Milk Plant and Pasteurization Plant Inspections

All Massachusetts producers are inspected at least twice a year and all out of state producers holding a Massachusetts dairy farm Certificate of Registration are inspected at least once a year. In addition to the 453 dairy farms under inspection in Mas- sachusetts we had 5,715 dairy farms under inspection in our supplying states as of January 1, 1989.

Our out of state milkshed expanded in F.Y. 89 by our inspection of additional producers in the central portion of New York State and our inspection in Pennsylvania of the Borden's Milk Plant in Wellsboro, Pennsylvania. In addition we inspected 24 Pennsylvania producers shipping to this plant. The Borden's plant is unique in that it is putting up aseptic milk. The aseptic processing of milk heats the milk to a very high temperature which essentially makes the milk sterile at that point. The milk is than packaged in hermetically sealed containers. This method of processing creates a shelf stable product which may be left on the shelf in the grocery store for a six month period of time with no refrigeration. Although the market is not large for this product there are niche areas where it will fit in. We are hopeful that the Borden Company is successful in marketing the product in Mas- sachusetts.

On June 30, 1989 we had 7 milk plants under inspection in Massachusetts. In our out of state areas we had 19 milk plants and 22 pasteurization plants under inspection.

Our statistics section at the end of this report gives the actual number of inspections made by the Bureau of Dairying staff in F.Y 89 in addition to many other statistics.

Mastitis Program

At the present time there are 317 Massachusetts dairy herds enrolled in the Mastitis program. This program is carried out in conjunction with the Paige Laboratory at the University of Massachusetts in Amherst and it continues to be of valuable assistance to all participating dairy farmers. The program is voluntary; however, the 317 herds enrolled out of a total of 453 herds in the state represents a 70% level of participation. We are very pleased with this level of participation. The 136 producers not on the program represent a focal point for us to work on and encourage to join the Massachusetts Mastitis Sampling Program.

Interstate Milk Shippers Program

Our Interstate Milk Shipper's program has progressed well in the past year. We now have 13 separate Interstate Milk Shipper's Bulk Tank Unit ratings under inspection. We have our dairy farm water supply records on the computer and in addition we have our hauler sampler records on the computer. These computer programs are assisting us to properly monitor the required sampling and inspection intervals. We are continuing to ledger all of our Massachusetts dairy farm inspection score forms and this mode of operation is assisting us greatly when the time comes to conduct an Interstate Milk Shipper's rating.

Dealer Registration

During the 1989 fiscal year a total of 115 Milk Dealers were registered as required by Chapter 94, Section F of the General Laws.

Legislation and Regulations

One adjustment to our Milk Plant Regulations was duly promulgated in the past year. This adjustment will allow us to inspect a designated milk handling system in a plant if it can be shown that this equipment will keep the milk in question separate from all other milk entering the particular plant. With this regulation in place we are able to inspect the portions of a milk plant involved with processing fluid milk for the Massachusetts market and the producers assigned to the inspected sections instead of inspecting the entire plant and all of the producers shipping to it. We used the provisions of this regulation for the first time when we inspected the Borden's Plant in Wellsboro, Pennsylvania.

We are continuing to work on new Dairy Farm Regulations and new Milk Plant Regulations as time and available assistance permits.

Our Dairy Laws Manual is still in the works. We hope to have this manual completed and in the hands of interested parties by July 1, 1990.

Milk Pricing

Although we are not in the area of regulating milk prices we do want to include in this report the fact that there was an extensive effort from many directions to enhance the price of fluid milk at the farm during the 89 fiscal year.

A. In October of 1988 Commissioner Schumacher held a state wide hearing in Northampton, MA to see if he should attempt to enhance the farm milk price as allowed by Chapter 94, Section 10 and 11 of the General Laws. This hearing resulted in the Commissioner putting a $1.35 over order floor price on every 100 pounds of fluid milk sold in Massachusetts. This over order price is tied to the Class I utilization of the milk.

B. There is presently a bill in the legislative process to raise the price of fluid milk by 8 cents per gallon in Massachusetts. The majority of the funds raised by this bill would be returned to each Massachusetts dairy farm according to its production.

C. Consideration of a Northeast Dairy Compact is still going on in the Northeast States.

Temporary Milk

During the fall of 1988 and for the first time in many, many years, temporary milk was allowed into the Massachusetts market as provided by Chapter 94, Section 16H of the General Laws. The Agri-Mark, Inc. Cooperative pursued Commissioner Schumacher to allow this temporary milk in due to the shortage of available Massachusetts approved fluid milk in the milkshed. This milk came to Massachusetts from the Maryland-Virginia Cooperative during October and November of 1988.

Statistics - FY89

Our field and office staff has held steady over the past year with one exception. In July of 1988 Leo Cormier, who was our flavor specialist resigned from the Department to pursue other employment. Since Mr. Cormier left the Department we have had no calls from anyone for assistance on their milk flavor. This is not meant to mean that there are no milk flavor problems but, that no one is making an issue of milk flavor at this time.

As of June 30, 1989 we have 11 Inspectors (2 1/2 working full time on the Mastitis program and 8 1/2 working full time on dairy farm and milk plant inspections), 3 Senior Inspectors (1 working full time on the Mastitis Program and 2 working full time on dairy farm and milk plant inspections) 1 Supervising Inspector, 1 Chief, and 2 Secretaries.

Dairy Farms Inspected

Approved	5,887
Not Approved	1,628
Dairy Farms Reinspected	1,752
Approved	1,474
Not Approved	278
Ten day letters sent to producers on reinspection for failure to correct violations noted on the inspection report	272
Hearings Held	18
Producers excluded for failure to comply with the regulations after receiving a ten day letter and/or a hearing being held	15
Producers Reinstated	13
Other Farm Visits	1,881

Plants

Milk Plants Inspected	111
Approver	102
Not Approved	9
Plants Spot Checked	23
Dealer Visits	178

Samples

Water Samples Collected	267
Milk Samples Collected	18

Mastitis Program

Herds Sampled	562
Cows Sampled	33,584
Samples Collected	133,463

I.M.S. Sampling Surveillance Program

Bulk Tank Samplers Checked	32
Bulk Tank Trucks Checked	54

I.M.S. Dairy Farm Inspection Program

Massachusetts Dairy Farms rated	175

U.S.D.A. Dry Milk Sampling Program

Days Sampling Skim Milk Powder	0

Milk Flavor Program

Milk Samples Flavored	149

The Bureau of Dairying traveled a total of 350,620 miles during the fiscal year to accomplish this work.

Bureau of Farm Products

George M. Porter, Chief

With the retirement of James M. Cassidy and the resulting need to train inspectors to accommodate its many services, the Bureau of Farm Products underwent some major changes in 1989.

The Bureau of Farm Products administers a diversified quality-control program for farm products, including the Federal-State Fruit and Vegetable Shipping Point Inspection Service. It also enforces truth-in-labeling laws for feed, seed, fertilizer and limestone, regulates certain produce-branding labeling and storage laws, and collects more that $100,100 annually in product registration and inspection fees. In addition, the Bureau publishes a weekly wholesale Apple Report listing market prices and storage-holding Apple Report listing market prices and storage-holding information.

Because of the complexity of the various regulate products, the Bureau's inspectors attended Northeast Inspectors Training School to upgrade their ability to perform effectively in this inspectional field.

Our young field staff is now fully trained and licensed by the U.S. Department of Agriculture, which allows them to issue federal certificates attesting to the quality, condition and grade of Massachusetts produce shipments.

In addition, the inspectors analyze and test control-led-atmosphere apple storage room; sample feed, seed and fertilizer for testing at the West Experiment Station at the University of Massachusetts in Amherst; inspect and regulate produce at wholesale markets, retail store and farm stands for conformance to certain labeling and branding laws; keep accurate records of such transactions; and perform other related duties as required by the Bureau.

A new computer program designed to sort out the various grades and blends of fertilizer used on Massachusetts soils was introduced during this year. The Uniform Fertilizer Tonnage Reporting System (UFTRS) was developed by the Tennessee Valley Authority (TVA) and the entire program package was donated by TVA to the Bureau so that tonnage reports would become more accurate. During this year 70,558 tons of fertilizer applied to our soils.

Fruit & Vegetable Inspection

Demand for our inspection services again was weighted heavily toward export apples, primarily those shipped to the United Kingdom and Canada. Apples also were inspected for shipment to California, where demand has been increasing steadily. All totaled, more than 235,500 bushels of Massachusetts apples carried federal-state inspection certificates for export.

The export apple inspections are of major importance, primarily because of the demand for controlled-atmosphere stored apples, including our valuable McIntosh variety and quality packs. McIntosh apples cannot be grown successfully in European countries. The controlled-atmosphere method of storing apples greatly lengthens the marketing season, allowing shipment of apples in good condition well into June.

Inspection certificates also are issued for potatoes in the Connecticut Valley, and for cranberries on Cape Cod.

Feed Program

Some 3,059 labels of animal feed, pet food and medicated feed ingredients were reviewed and registered during the

year. Samples of products offered for sale were drawn and tested at the West Experiment Station.

Fertilizer Program

A total of 1,023 labels of fertilizer were reviewed and registered. Tonnage taxes were assessed and collected semi-annually. Assessment penalties in shortage of guarantee level were levied, with fines collected turned back to farmers or submitted to the state Treasury.

Seed Program

Bureau inspectors tested 142 official samples of seed, crop seed, vegetables, lawn mixtures, flower tree and shrub seed, etc., for truth in labeling. Stop-sale orders were issued on violations, involving seed packages. Seed was removed if it showed germination, noxious weeds, or other unfit characteristics. Violations were sent to the USDA Seed Branch for further action.

Due to budget restraints, the seed lab at West Experiment Station was closed down for the first time in its history of operation. Seed was sent to New York Experiment Station for testing on a very limited budget.

Lime Program

39 limestone brands and grades were registered and checked for conformance to labeling during the fiscal year.

Branding Laws

Inspections were made at farms and at wholesale, retail, and roadside markets to enforce apple, potato and native laws. Misbranded products were relabeled or removed from sale. More than 3,000 retail stores and many packing-house operations were inspected.

Storage Laws

Records are kept on cold-storage and controlled-atmosphere apple rooms in order to check compliance with storage laws, thereby allowing those products to move into certain market areas of the country.

Conclusion

The Bureau, though strict adherence to laws, grades, label reviews and other essential data, has one much to upgrade the quality and condition of farm products offered for sale in Massachusetts. These programs reflect general crop conditions and market situations. The uniform laws and grades allow for products in interstate and export commerce. Working with other states, the regulated industries, the USDA, the Food and Drug Administration and various regulated industries, the Bureau and Department have helped foster the marketing of high-quality products.

Seed Inspection Program - samples officially tested

	1984	1985	1986	1987	1988	1989
Agriculture	61	73	47	54	63	28
Mixtures(Lawn)	33	80	68	73	75	--
Vegetables	361	537	551	421	467	114
Flowers	101	158	115	104	110	--
Sprouts	10	3				
TOTAL	566	848	784	654	715	142

Fruit and Vegetables Inspection Revenue - fiscal year

	1984	1985	1986	1987	1988	1989
Apples	$8,678.15	9,218.41	7,972.74	6,375.35	8,861.511	8,746.25
Cranberry	280.00	1,321.00	140.00	700.00	420.00	560.00
Onions	314.02					
Potatoes	920.24	469.00	66.69	41.85	100.00	118.80
TOTAL	10,192.41	11,008.41	8,179.43	7,117.29	381.51	19,425.05

Feed and Lime Registration- calender year

	1984	1985	1986	1987	1988	1989
Feed/a	2,100	2,035	2,173	2,475	2,975	3,059
Fertilizer/b	1,000	980	926	1,110	1,220	1,023
Fertilizer/c	26	27	30	30	26	23
Lime	26	35	35	36	39	39

Feed, Fertilizer and Lime Revenue - calendar year

	1984	1985	1986	1987	1988	1989
Feed/a	$52,500	$50,875	$54,325	$61,875	$74,375	$76,475
Fertilizer/b	25,000	24,500	23,150	27,750	30,500	25,575
Fertilizer/c	3,250	3,375	3,375	3,750	3,250	2,875
Lime/d	650	875	875	900	975	975

/a Brands/d Brands
/b Specialty brands/e Tonnage
/c Commercial plants/f Penalties

* Registration and revenue are collected on a calendar year for feed and fertilizer
* Revenue generated by inspection and registration fees totaled $147,369.14

Bureau of Milk Marketing

John B. Kelley, Chief

The Boston fluid milk market serves a population of 8 million people. It encompasses Massachusetts, southern New Hampshire, Rhode Island, and parts of Connecticut. The increase in the commercial disappearance of milk along with declining support prices, caused extreme tightness in the raw milk available in this market during the fourth quarter.

A dramatic increases in exports of milk products along with unusual market conditions in major milk producing areas of the United States resulted in record prices for milk in the Boston market. Market conditions will return to normal during the spring of 1990 and prices will reflect this normalization.

Massachusetts dairy farmers received record prices for their milk in 1989. This coupled with a good fourth quarter in 1988 has allowed the industry to stabilize after going through several lean years.

Changing consumer preferences for lower fat milk resulted in the classic homogenized milk capturing less than fifty percent of sales for the first time in the Boston market. The trend to low fat milk, as well as the trend toward plastic gallon packaging, continue in the upcoming year, driven by consumer demand.

The closing of a first line fluid handling plant in an adjoining state continued the trend towards increased milk processing in Massachusetts, which lays in the heart of the Boston market. The trend to low fat milk and the resulting spin-off of fresh cream is a driving force in increased ice cream, novelty and soft product manufacturing in the state.

The Massachusetts Producer Security Trust Fund showed continued growth during the year surpassing the half million dollar mark for the first time. Proceeds of the fund are invested by the Treasure of the commonwealth in Municipal Depository Trust.

Proprietary handlers with Massachusetts producer payrolls are required to post bond or other security, regardless of whether the receiving handler is located in-state or out-of-state. the security posted must equal the value of payment for one payment period plus ten percent. There is no limit on this bond. The security must comply with provisions Massachusetts General Law Chapter 94, Section 42, and is reviewed on an ongoing basis with amounts posted marked to market.

The Bureau continues its policy of licensing fluid milk handlers operating in Massachusetts, retial establishments selling milk in the Commonwealth, bulk tank drivers, and individuals testing milk for butterfat content. Educational seminars for bulk tank drivers were held in different parts of the state during the year. Bulk milk tank drivers are responsible for taking samples of milk at every farm before pick up. The testing of such samples at receiving plants before unloading is the key to guaranteeing a safe fluid supply in today's market.

Under Mass. General laws chapter 94, an inspector continued to cross-test and check both on-farm and in-plant verifying payment to producers.

Pesticide Bureau

Gail Kaprielian, Chief

Fiscal Year 89 proved to be a challenging one for the Pesticide Bureau as a result of staffing cuts and changes and the increasing fiscal concerns. Despite these setbacks, the program continued to be highly productive.

Licensing and Certification

In Fiscal Year 1989 the Pesticide Bureau continued to administer state pesticide examinations and approve applicator training sessions. Our efforts this year focused on the administrative process of pesticide licensure due to reductions in staff occurring later in the year. Nonetheless, a new initiative was undertaken when the Commissioner of Food and Agriculture approved the establishment of a Pesticide Licensure Task Force. This effort was initiated for the purpose of reviewing the current pesticide licensure process that has not changed significantly since its inception and implementation in 1979.

The main goal of this working group is to propose recommendations to upgrade current pesticide standards and to improve upon the overall administrative efficiency of the program. The Task Force met several times during the year and will present a report to the Pesticide Board in early 1990.

The agreed upon recommendations of the Task Force may require changes in policy and regulations. However, it is anticipated that these changes will be instrumental in making the current program stronger.

License

	Renewals	New	Total
Commercial	1,964	438	2
Private	1,642	100	1,742

Certification

Commercial Applicant or License	1,002	576	
Dealer License	100	20	120
Grand Total	4,708	1,114	5,842

Enforcement

The Enforcement program has lost several inspectors and as FY89 drew to a close the staff consisted of two Supervising Inspectors and one Field Inspector. In order to maintain the high level of enforcement activity, inspectors were performing field work as well as assuming administrative duties in the Boston office.

Despite limited resources, 41 complaints of alleged pesticide misuse were investigated. The following affirmative inspections were conducted.

Restricted Dealer	22
Marketplace	102
Producer Establishment Inspection	19
Commercial Use Observation	20
Agricultural Use Observation	8
Company Records and Licenses	86

The Department issued 19 Administrative Orders and 87 Letters of Warning. Two Licensure hearings were held and one case was referred to the Attorney General's Office.

FY 89 was the first year in which the Pesticide Bureau worked closely with several District Attorneys in order to enforce the criminal penalties available pursuant to the Pesticide Control Act.

The Department in conjunction with the Middlesex County District Attorney's office successfully convicted an applicator for a variety of pesticide violations resulting in a two year sentence to the house of correction and a five thousand dollar fine. Working closely with the Suffolk County District Attorney's office a two thousand dollar criminal fine against a Boston company was issued for misuse of a pesticide and applying pesticides without proper certification. In conjunction with the Barnstable County District Attorney's office, the Department successfully prosecuted an applicator for misuse and applying a restricted use pesticide without proper certification. The applicator was fined seven thousand dollars, however, the conviction was not upheld in a subsequent jury trial.

A voluntary records inspection program was initiated to reach out to all pesticide users who are hesitant to ask the Department for help in keeping proper pesticide records. The program gave applicators the opportunity to get assistance with recordkeeping with no resultant enforcement action if deficiencies were found. During the inspections, other pesticide and regulatory issues were also discussed. 110 private applicator inspections and 6 commercial applicator inspections were conducted under this voluntary program.

Other Program Activities

A pesticide disposal program was initiated to allow old unwanted pesticides to be disposed. This program is a joint effort involving manufacturers, user groups and The Department of Environmental Protection.

The department continued its support of the Cape Cod Golf Course study. This study monitored pesticide and nitrates in the ground water under golf courses.

The Bureau continued a monitoring project which sampled and analyzed pesticides in private wells surrounding agricultural fields growing corn. Atrazine was the only pesticide found during the 2 years of study.

The Massachusetts Pesticide Analytical Laboratory continued the third year of the Corn Herbicide Study. This project studied the movement of corn herbicides in soul and analyzed groundwater to assess contamination.

A Department of Environmental Protection and Department of Food and Agriculture ad hoc committee began review of herbicides for use in sensitive areas along right-of-ways pursuant to the Right-of-Way Management regulations.

Pesticide Board and Subcommittee

The Pesticide Board Subcommittee completed a State Individual Review on 2,4-D and as a result, 2,4-D containing pesticides containing over 20% active ingredient were classified state restricted use. The action also require additional protective clothing to be worn by applicators.

The Pesticide Board approved regulations affecting the use of tributyltin (TBT). These regulations prohibit the use of TBT based paints on non-aluminum hulled and vessels less than 8 feet (25 meters). They also prohibit the improper disposal of TBT paint and scrapings.

The Ground Water Protection Strategy was adopted. The strategy proposes to prevent groundwater contamination from pesticides by assessing pesticides their uses and controlling high impact users.

Bureau of Plant Pest Control

Warren Shepard, Chief

Nursery Inspection

One of the main functions of the Bureau of Plant Pest Control is the annual inspection of all known plant nurseries offering stock for sale. The bulk of the inspection are done on an "as needed" basis.

Most of our seasonal nursery inspectors are college students who have had training and college courses in entomology and ornamental horticulture. Two inspectors are full-time and perform nursery inspections as part of their regular duties.

1989 was an average year for nursery pests and while nothing unusual was found during the summer inspection period that begins on July 1st, the following pests were noted by the summer inspectors.

- Japanese Beetle
- Leaf Miner
- Aphids
- Spruce Gall
- Pine Tip Borer
- Red Spider
- Black Vine Weevil
- Leaf Spot
- Taxus Weevil
- Scale
- White Fly
- Lace Bug
- Slugs
- Scab
- Leaf gall
- Thrip
- Powdery Mildew
- Sooty Mold
- Web Worm
- Fungus
- Skeletonizer
- Sawfly
- Rose Chafer
- Canker
- Anthracnose
- Rust
- Oak Leaf Scalper
- Mealy Bugs
- Tent Caterpillars
- Mosaic

Nurseries inspected this year totaled 307. Greenhouses also inspected during the 1989 season amounted to 44. Agents licenses issued to those farms and individuals to sell, but not grow, nurserystock amounted to 297. The chart listed below shows our fee schedule imposed for the registration of agents as well as the inspection fees for nursery growers.

Schedule of Inspection Fees

less than one acre in stock	$ 5.00
1 - 5 acres	$15.00
6 - 25 acres	$20.00
25 - 100	$25.00
over 100 acres	$35.00
Greenhouse (not in nursery)	20.00
Agents	$20.00

Special Certifications

State Plant Phytosanitary certificates issued	207
State Tree & Seed Certifications issued	300
Federal Phytosanitary Certificates issued	48
Ribes Control Area Permits - Currant Plants 2 for	29
Ribes Control Area Permits - Gooseberries	25
Houseplant Inspection Certificates Issued	89

Survey and Trapping

Due primarily to reduced staffing levels and a greatly reduced state budget, only limited survey work was done in 1989. Spot checks, however, were made for Golden Nematode, Red Steele in strawberries and Gypsy Moth on lands surrounding our plant nurseries.

All spot checks were negative except for the Gypsy Moth which was light to medium on wooded lands near some nurseries. Indications are that Massachusetts will begin to see increased population levels of gypsy Moth as this pest begins its upward spiral and control work decreases. (reduced state and local budgets do not allow for spraying)

Collaboration with U.S.D.A. - A.P.H.I.S.

Massachusetts attempted to maintain its association with the U.S.D.A. by working on the following projects: Black Stem Rust, Postentry Quarantines, genetic engineering permits, and soil importations.

It should also be noted that the two new certification programs started last year, were continued in 1989, namely the growing of virus-free strawberry & raspberry plants, and the Cape American Beachgrass (Ammophilia Breviligulata Fernald).

There are presently 6 growers located on Cape Cod that are certified growers of this Beachgrass.

Again in 1989 five seasonal apiary inspectors were employed under the direction of our Chief Apiary Inspector, Alfred Carl Jr. to inspect our local and migratory honeybees.

The inspection period usually begins soon after May 1st and ends October 31st of each year. Honey plants such as Black Locust, Blackberry, Sumac, Basswood, Cover, Purple Loosestrife and Goldenrod did secrete enough nectar to produce an average crop of honey. Some beekeepers had an above average year with a large honey crop while others had no honey at all.

Samples of adult bees were taken and examined for the presence of the Trachael Mite in conjunction with A.P.H.I.S. During the year these samples were taken from both migratory colonies as well as domestic hives.

Even though Menthol has both a federal and state registration in Massachusetts, Trachael Mites were found in many more hives across the state. It is expected that the Trachael Mite will spread in spite of increased survey work by our state inspectors, a permit system for only allowing certified hives into the state, and, treating by individual beekeepers.

Apiary Inspection

The 1989 apiary inspection program had much better progress that in the previous year. Not only was staffing returned to its normal level, but considerably more time was devoted to our regular inspection work for diseases such as foulbrood and Nosema.

Six inspectors, including our Chief Apiary Inspector, started apiary inspection around April 15th and work continued until mid-fall. Two additional inspectors were hired for the month of June solely to survey for Varroa Mites.

It should be pointed out that due primarily to the low number of hives inspected during 1988, that a determined effort was made to inspect those not done the previous year. As a result, 9,460 resident hives were liked at in 1989 with A.F. B. showing up in 2.15% of the hives, E.F.B. at 0.27% and Varroa at 7%.

This last figure is particularly important as our feeling is that the Varroa is not spreading rapidly across the state. It should be pointed out that since Varroa was first found in Massachusetts in June of 1987, it has only spread to four southeastern Massachusetts counties except for isolated cases in Middlesex County north of Boston.

Our Varroa detection continues to be done both with the Ether roll method and The Apistan strips. A complete breakdown of the 1989 inspection season is as follows:

Perhaps it should be pointed out that in 989 Massachusetts became the first state in the country to register Menthol for Trachael Mites, a move later adopted by several other states. Beekeepers now have at least one legal tool to use for this apiary pest that is spreading at an alarming rate with large losses being reported be beekeepers across the state.

We are now in the process of working with both E.P.A. and the Nor-Am Chemical Co. to get their product Miticur registered by E.P.A. with a rating of a "Section 3" rather than a Section 18 which Apistan has. If this comes to fruition then beekeepers will have (1) a second material they can use for Trachael mites and (2) another compound they can purchase and use for both pests.

New regulations were adopted in April of 1989 that require package bees and queens to have a permit issued by the Bureau of Plant Pest Control in order to be allowed into this state. This was a regulation requested by the resident beekeepers but is being met with mixed success. Other legislation is pending to slow down the movement of all hives from our infested to the uninfested areas of the state.

Finally, in this computer age, we are working with the U.S.D.A., A.P.H.I.S., other states and the University of Massachusetts to continuously update the spread of Varroa and Trachael Mites by generating maps and data of the spread and movement of both of these pests.

State Reclamation and Mosquito Control Board

Charles Costa, Chairman

Board Changeover

March 1989, the Chairman of the Board, Lewis F. Wells, Jr. retired from the Department of Food & Agriculture after thirty-five years of state employment. Commissioner Schumacher appointed Charles Costa as his replacement. The Board,also, lost another member, Donna Bishop of the Department of Environment Protection. George Zoto of DEP was appointed as her replacement. The other Board member, Thomas Lynch of Department of Environment Management may be retiring in 1990. The Board hopes to continue the on-site meeting to gain greater insight of the issues through the on-site visits.

Budget

Before the FY90 Budget was approved, the mosquito projects were taken off the State Budget by the amount of 3.5 million dollars. Due to the help of the Representatives of each mosquito district this budget got reinstated. The mosquito projects are finding it difficult to operate within their budget the same as all other state agencies.

In FY90 the mosquito control budgets were changed from 50% State funded and 50% Local Aid to 100% Local Aid. With this drastic change in funding, the projects are concerned that cities and towns may withdraw from the program due to the extra cost. Also, the State Reclamation Board's budget has in the past been funded 100% by the State. In FY90, Legislature cut the Board's budget has in the past been funded 100% by the State. In FY90, Legislature cut the Board's budget 50% and now it is charged back to the cities and towns within the program.

GEIR Report

The Chairman of the Citizens Advisory Committee, Malcolm Henry, has sent a letter to the other members to inform them that the final draft of the GEIR report is completed. There will be a meeting forthcoming for this committee to get this report to the publisher.

The Town of Harvard withdrew from Central Mass Mosquito Project. The Town of Wilmington joined the Central Mass Mosquito Project. In Plymouth County Mosquito Project, the Town of Kingston joined the program. Even though the cities and towns are finding the phone calls from other cities and towns inquiring as to how they may join the program.

Information

Massachusetts hosted the 55th Annual Meeting of the American Mosquito Control Association at the Hyatt Regency in April 1989. Representatives from all the states and other countries attended. Northeastern Mosquito Control Association officers are to be commended for the excellent job they performed by providing very interesting topics and different perspectives on the need for controlling mosquitoes. The Northeastern Mosquito Control Association officers consist of three Superintendents from the nine mosquito control projects and a representative from the state of Rhode Island along with four directors: one representing New Jersey, one representing the state of Connecticut; a Commissioner from Central Mass Mosquito Project and Superintendent from Massachusetts.

Massachusetts Farming in the 1980's

Farming in Massachusetts has undergone many changes during the 1980's. Innovations in cranberries, greenhouse, nursery and vegetable production more than offset declines in dairying to enable the farming sector to substantially expand farmgate receipts to$486 million.

Baystate farmers now produce nearly as much as their neighboring farmers in Vermont and Maine. And in 1986, they surpassed them. This is quite an achievement. Farm numbers are growing, reaching 6,900 in 1989, with some additions to farmland, now approaching 603,000 acres,over double the acreage in the state park system and accounting for 10% of the land area of the state.

Major private and public initiatives that contributed to the growth in Massachusetts farming and food processing were:

1. **COOPERATIVE DEVELOPMENT:** Ocean Spray (rapidly approaching $1 billion in sales), United Cooperative Farmers in Fitchburg, the new efforts by Pioneer Vegetable Growers Association and the Deep Root Trucking Association, underpinned a private sector committment to family farming here.

2. **FARMLAND PROTECTION:** Some 275 farmers committed nearly 26,000 prime acres to be forever protected with the sale of development rights. The first statewide program in the country is now emulated in another 14 states.

3. **AGRICULTURE AND THE ENVIRONMENT:** Farmers, with strong support from UMASS Extension and the Department, made great strides in reducing pesticide use via IPM, managing manure runoff through holding tanks and compost programs and in protecting against erosion via the modest investment funds provided under the Massachusetts Emergency Assistance Program (MEAP).

4. **MARKET DEVELOPMENT:** Bay State producers and processors became known nationally in the 1980's for their many innovations in market development. Ably assisted by the volunteer Commodity Promotion Committee, the "Massachusetts Grown...and Fresher!" logo become widely known in supermarkets, roadside stands and farmers markets. Roadside stands expanded during this decade as did city and rural farmers markets, growing to nearly 70 from a base of some 12 in 1980. Innovations such as support from Bank of Boston and foundations to the Federation and the introduction of the widely copied Farmers Market Coupon Program assisted in this growth.

Important 1980s events:

1980 - Agricultural Preservation Program acquires first farm property to be protected

1981- Massachusetts hosts the annual meeting of the National Association of State Departments of Agriculture (NASDA)

1982 - the Massachusetts dairy herd is certified "FREE" of Bovine Brucellosis

1982 - Commissioner Frederic Winthrop, Jr. reappointed by Governor Dukakis

1983 - Bay State cows accredited "free" of Tuberculosis

1984 and **1987** - Massachusetts farms hit by serious floods

1985 - Commissioner August Schumacher, Jr. appointed by Governor Dukakis

1986 - the Whole Herd Dairy Buyout causes the loss of, at one federal policy stroke, 66 family dairy farms

1986 - Integrated Pest Management secures state financing support

1986 - Farmers' Market Coupon Program founded

1986 - MDFA Central Massachusetts field office opened in Lancaster

1986 - Avian Influenza outbreak cleared

1988 - the animal rights referendum, which had national ripples, suffers a major defeat

1988 -drought and heat scorch the Bay State and the nation

1988 - the ALAR problem hurts local apple growers

1989 -Massachusetts hosts the National Food and Agriculture Exposition, sponsored by NASDA, featuring some 500 U.S. food companies and attended by buyers from around the world.

1989 - the closure of Foxboro and problems at Suffolk race courses which negatively impacted our important horse breeding industry

1989 - farmers' markets expand to 70 sites , up from 12 in 1980

MASSACHUSETTS AGRICULTURAL HIGHLIGHTS

Compiled by Thomas Gallagher, Statistician

BERRIES

ACRES: 13,385

GROWERS: 890

Berry Type, Acres and Growers

Berry	Acres	Growers
Blackberries	7	11
Tame Blueberries	370	159
Wild Blueberries	449	21
Cranberries	12,091	498
Raspberries	94	133
Strawberries	372	213

Distribution of All Berry Farms and All Berry Acres by Region and County

COUNTY	FARMS PRODUCING	ACRES
WESTERN MASSACHUSETTS		
Berkshire	18	25
Franklin	31	265
Hampshire	43	137
Hampden	43	272
Region Total	135	699
CENTRAL MASSACHUSETTS		
Worcester	58	169
Region Total	58	169
EASTERN MASSACHUSETTS		
Essex	51	103
Middlesex	22	54
Norfolk	18	63
Suffolk	--	--
Plymouth	439	10,649
Bristol	60	422
Region Total	600	11,291
CAPE COD AND THE ISLANDS		
Barnstable	88	946
Dukes	6	withheld
Nantucket	3	withheld
Region Total	97	1,226
Total	890	13,385

PRODUCTION TRENDS

BERRY	1982	1987
	(pounds)	
Blackberries	3,465	6,107
Tame Blueberries	404,013	477,264
Wild Blueberries	140,543	316,089
Cranberries	1,194,692 *	1,433,505 *
Raspberries	121,050	148,588
Strawberries	2,083,206	1,506,102

*Barrels

Source: 1987 Census of Agriculture, U.S. Department of Commerce

CHRISTMAS TREES

ACREAGE: an estimated 6,000 acres

PREDOMINANT SPECIES: spruces and firs

PRODUCTION: an estimated 50,000 trees harvested in 1989 and expected to steadily increae

MARKET OUTLET: 95% of the trees are direct marketed at roadside

Distribution of Christmas Tree Farms

COUNTY	COMMUNITIES	GROWERS	ACRES
Western Massachusetts			
Berkshire	11	32	389
Franklin	15	44	524
Hampshire	12	54	642
Hampden	18	72	862
Region Total	56	202	2,417
Central Massachusetts			
Worcester	47	124	1,489
Region Total	47	124	1,489
Eastern Massachusetts			
Essex	17	54	642
Middlesex	22	56	676
Norfolk	7	11	135
Plymouth	14	27	321
Bristol	11	20	236
Region Total	71	168	2,010
Cape Cod and the Islands			
Barnstable	4 (estimated)	6	34
Dukes		Not Available	
Nantucket		Not Available	
Region Total	4	6	34
State Total	178	500	5,950

Source: Massachusetts Christmas Tree Association And Massachusetts Department Of Food And Agriculture

FEED CROPS

	Hay	Corn Silage
ACRES:	**121,000**	**29,000**
FARMS PRODUCING:	**2,874**	**604**
PRODUCTION:	**251,000 (Tons)**	**524,819 (Green Tons)**

Distribution of Feed Crops by Region and County

COUNTY	HAY ACRES	SILAGE CORN ACRES
WESTERN MASSACHUSETTS		
Berkshire	17,720	4,131
Franklin	15,587	3,923
Hampshire	13,534	4,200
Hampden	7,688	2,646
Region Total	54,529	14,900
CENTRAL MASSACHUSETTS		
Worcester	30,440	6,623
Region Total	30,440	6,623
EASTERN MASSACHUSETTS		
Essex	9,286	757
Middlesex	9,810	1,211
Suffolk	Not Available	Not Available
Norfolk	3,295	Not Available
Plymouth	5,462	2,206
Bristol	8,089	2,731
Region Total	35,942	Not Available
CAPE COD AND THE ISLANDS		
Barnstable	Not Available	Not Available
Dukes	499	Not Available
Nantucket	Not Available	Not Available
Region Total	Not Available	Not Available
State Total	121,498	28,643

* Hay - Alfalfa, other tame, small grains, wild, grass silage, green chop, etc.
Source: 1987 Census Of Agriculture, U.S. Department Of Commerce

CRANBERRIES

ACREAGE: **12,355 (productive), 699 (not bearing), 13,054 (total)**

PRODUCTION: **1,820,000 barrels**

MARKET: **7 handlers supplying either the fresh or process markets**

GROWERS: **498**

Massachusetts produces approximately 48 percent of the U.S. crop. Cranberry production occurs in 45 communities in seven counties in eastern Massachusetts. Eighty percent of the total acreage is highly concentrated in a cluster of Plymouth county communities. Sixty-one percent of the Commonwealth's 498 growers manage 11 acres of bog or less.

Counties with Acreage in Cranberry Fruit Production

County	Communities	% of All Acres
Middlesex	1	%
Worcester	1	%
Norfolk	3	%
Bristol	8	3%
Nantucket	1	2%
Barnstable	11	7%
Plymouth	20	87%
	45	100%

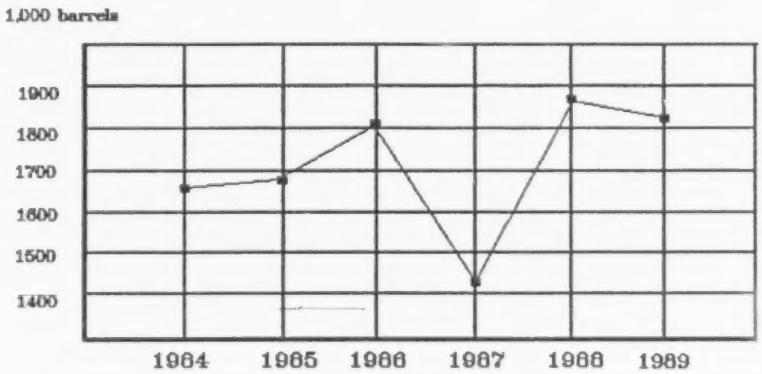
Plymouth County: The Nucleus of Cranberry Production

Community	Acres	% of All Acres
Carver	2,870.3	24%
Wareham	1,517.0	13%
Plymouth	1,045.9	9%
Rochester	955.9	8%
Middleborough	954.4	8%
	7,343.5	62%

Five Year Production Trend

Year	Yield/Acre (barrels)	Total Production (1,000 barrels)
1984	148.5	1,660
1985	149.3	1,680
1986	160.4	1,810
1987	122.8	1,440
1988	157.7	1,860
1989	146.2	1,820

Cranberry Production Trends



Cranberry Acreage of Independent Growers and Ocean Spray Combined

Year	Productive Acres	Non-Bearing Acres	Total
1986	11,644	1,093	12,737
1987	11,976	678	12,654
1988	12,142	580	12,722
1989	12,355	699	13,054

Sources: Ocean Spray Cranberries, Inc., New England Agricultural Statistics (USDA), Agriculture Stabilization And Conservation Service (USDA) And Cranberry Marketing Committee (USDA)

Production Trends for Silage Corn and All Types of Hay

	Silage Corn	
	Yield/Acre Tons	Total Production 1,000 Tons
1985	19.00	741
1986	18.00	648
1987	18.50	629
1988	19.50	644
1989	18.50	555

GREENHOUSE AND NURSERY

FARMS: 824

GROWING AREA: over 10,000,000 square feet under cover and in excess of 3200 acres in open ground

MAJOR CROP CATEGORIES: floriculture, nursery, vegetables, sod and mushrooms

MARKETING OUTLETS: retail florists, garden centers, farm stands, chain stores, wholesale market, and landscapers.

Year	Production Area Sq ft under cover	Acres in open
1982	8,261,749	2,605
1987	10,066,833	3,208

Distribution by Region and County

County	Farms producing	Square feet under cover	Acres in the open
WESTERN MASSACHUSETTS			
Berkshire	32	286,409	withheld
Franklin	54	284,578	525
Hampshire	60	783,354	160
Hampden	72	862,151	266
Region Total	218	2,216,492	951
CENTRAL MASSACHUSETTS			
Worcester	123	985,061	303
Region Total	123	985,061	303
EASTERN MASSACHUSETTS			
Essex	85	1,114,624	389
Middlesex	120	2,489,743	868
Suffolk	3	51,000	Withheld
Norfolk	54	1,152,642	105
Bristol	86	1,204,181	239
PLymouth	75	543,093	224
Region Total	423	6,555,283	Not Available
CAPE COD AND THE ISLANDS			
Barnstable	42	206,463	73
Dukes	12	29,434	7
Nantucket	6	74,100	Withheld
Region Total	60	309,997	Not Available
State Total	824	10,066,833	3,208

Source: 1987 Census of Agriculture, U.S. Department of Commerce

Massachusetts Nursery and Greenhouse Crops Grown for Sale

Crops	Farms	Square Footage Under Protection	Acres In The Open
Nursery, Floriculture, Vegetable And Flower Seed Crops, Sod, Etc. Grown In The Open	192	Not Applicable	1,098
Bedding Plants	445	4,015,097	207
Bulbs	10	22,800	Suppressed
Cut Flowers And Florist Greens	128	1,436,611	129
Foliage And Potted Flowering Plants	267	3,672,082	125
Foliage Plants	66	536,480	26
Potted Flowering Plants	240	3,135,602	99
Nursery Crops	244	518,082	2,502
Vegetable And Flower Seeds	23	51,686	3
Greenhouse Vegetables	39	324,054	Not Applicable
Other Nursey And Greenhouse Crops	11	Suppressed	Suppressed

Source: 1987 Census Of Agriculture, U.S. Department Of Commerce

Massachusetts Retail Nursuries, Lawn And Garden Supply Stores

GEOGRAPHY	FIRMS (NUMBER)	SALES ($1000)	ANNUAL PAYROLL ($1000)	FIRST QUARTER PAYROLL ($1000)	PAID EMPLOYEES FOR THE PERIOD INCLUDING MARCH 12 (NUMBER)
MASSACHUSETTS	210	118,119	18,881	3,213	1,310
WESTERN MASSACHUSETTS					
BERKSHIRE	9		SUPPRESSED		
FRANKLIN	6		SUPPRESSED		
HAMPSHIRE	5		SUPPRESSED		
HAMPDEN	14		SUPPRESSED		
REGION TOTAL	34		NOT AVAILABLE		
CENTRAL MASSACHUSETTS					
WORCESTER	35		SUPPRESSED		
REGION TOTAL	35		NOT AVAILABLE		
EASTERN MASSACHUSETTS					
ESSEX	22	15,226	3,052	480	187
MIDDLESEX	34	23,153	3,349	578	246
SUFFOLK	10	3,102	734	133	44
NORFOLK	22		SUPPRESSED		
PLYMOUTH	16		SUPPRESSED		
BRISTOL	16		SUPPRESSED		
REGION TOTAL	120		NOT AVAILABLE		
CAPE COD AND THE ISLANDS					
BARNSTABLE	16	7,462	1,154	138	82
DUKES			NOT AVAILABLE		
NANTUCKET			NOT AVAILABLE		
REGION TOTAL			NOT AVAILABLE		

Massachusetts Nurseries, Lawn and Garden Supply Stores
Selected Ratios: 1987

SALES PER FIRM (DOLLARS)	SALES PER EMPLOYEE (DOLLARS)	ANNUAL PAYROLL PER EMPLOYEE (DOLLAR)	EMPLOYEES PER FIRM (NUMBER)
562,852	90,258	14,413	6

COMPARATIVE STATISTICS: 1987 AND 1982 FIRMS

1987 (NUMBER)	1982 (NUMBER)
210	160

SOURCE: 1987 Census Of Retail Trade, Department Of Commerce

Massachusetts County Business Patterns for Landscape and Horticultural Services

	Number of Employees for the week including March 12	Payroll ($1,000) First Quarter	Payroll ($1,000) Annual	Total Number of Establishments
WESTERN MASSACHUSETTS				
Berkshire	109	228	2,095	44
Franklin	53	135	886	17
Hampshire	85	190	1,543	29
Hampden	346	1,087	6,589	93
Total	593	1,640	11,113	183
CENTRAL MASSACHUSETTS				
Worcester	444	1,406	11,662	151
Total	444	1,406	11,662	151
EASTERN MASSACHUSETTS				
Essex	446	1,546	12,144	180
Middlesex	1,427	4,654	35,324	430
Norfolk	589	1,679	12,059	173
Suffolk	275	1,623	7,580	37
Plymouth	487	1,507	11,700	126
Bristol	434	1,005	6,644	96
Total	3,658	12,214	85,451	1,042
CAPE COD AND THE ISLANDS				
Barnstable	500	1,503	12,170	170
Dukes	69	97	1,106	17
Nantucket	68	141	1,325	22
Total	637	1,741	14,601	209
State	5,332	17,001	122,827	1,585

(1) Landscape and horticultural services includes establishments engaged in landscape counseling, lawn and garden services, and ornamental shrub and tree services.
Source: 1987 County Business Patterns, U.S. Department of Commerce.

MAPLE

PRODUCTION: 24,000 (Gallons)

CASH RECEIPTS: 871,000 (Dollars)

PRODUCERS AND PROCESSORS: 200

MARKET OUTLET: primarily retail sales

Distribution of the Maple Industry

COUNTY	PERCENT of PRODUCERS and PROCESSORS
Berkshire	10
Franklin	43
Hampshire	27
Hampden	8
Worcester	8
All Other Counties	4

Facts

- Maple production is highly concentrated in areas within Franklin and Hampshire counties. Located within are 71% of the state's 200 producers and processors.
- The maple grove where trees are tapped and sap collected is measured not by the number the number of trees but the number of taps.
- Syrup production potential is 70,000 gallons.
- Fifty percent of production is sold during sugaring season. The balance of the crop is sold between Thanksgiving and Christmas.
- More sales are shifting into the retail category. Many producers are increasing sales through mail order.

Maple Syrup: Percentage by Type of Sale

	1985	1986	1987	1988	1989
Retail	*	59	73	64	66
Wholesale	*	29	21	18	28
Bulk	*	12	6	18	6

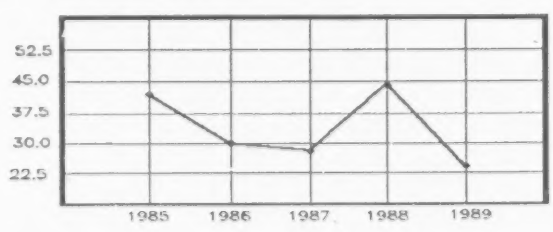
* Not available

Source: New England Agricultural Statistics (USDA), Massachusetts Maple Producers Association

Five Year Production Trend

	1,000 Gallons
1985	42
1986	30
1987	28
1988	44
1989	24

Five Year Production Trend



ORCHARD FRUIT *

FARMS PRODUCING: 572

ACREAGE: 9,380

MARKET OUTLETS: **Approximately 50 percent of orchard fruit production is sold through wholesale channels. The balance is through roadside stands, pick-your-own operations farmers' markets.**

Key Growing Areas

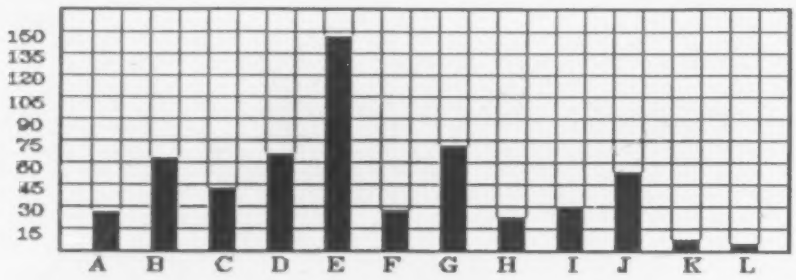
- **Nashoba Valley** - approximately 50 percent of the state's tree fruit acreage is found in Worcester and Middlese counties.
- **Franklin County** - especially in the vicinity of Shelburne.
- **Hampshire County** - east and west of the Connecticut River valley and especially Belchertown.
- **Hampden County** - east and west of the Connecticut River valley and especially Granville.

Distribution of All Farms and Acres in Orchard Fruit Production by Region and County

COUNTY	FARMS PRODUCING	ACRES
WESTERN MASSACHUSETTS		
Berkshire	27	250
Franklin	61	1,157
Hampshire	44	943
Hampden	68	923
Region Total	200	3,273
CENTRAL MASSACHUSETTS		
Worcester	147	3,443
Region Total	147	3,443
EASTERN MASSACHUSETTS		
Essex	29	484
Middlesex	74	1,327
Norfolk	20	158
Plymouth	30	138
Bristol	53	422
Region Total	206	2,529
CAPE COD AND THE ISLANDS		
Barnstable	9	38
Dukes	7	80
Nantucket	not available	not available
Region Total	16	118
State Total	572	9,380

*includes apples, apricots, cherries, grapes, nectarines, peaches, pears, plums etc.

Number of Farms in Orchard Fruit Production



Key:

A: Berkshire
B: Franklin
C: Hampshire
D: Hampden
E: Worcester
F: Essex
G: Middlesex
H: Norfolk
I: Plymouth
J. Bristol
K: Barnstable
L: Dukes

Production Trends

	APPLES 1,000 42-Pound Units	PEACHES 1,000 48 Pound Units
1985	2,119	44
1986	2,261	38
1987	2,285	42
1988	2,357	44
1989	1,786	44

Orchard Fruit Type, Acres and Growers

	Acres	Growers
apples	8,415	526
apricots	2	12
cherries	28	48
grapes	251	87
nectarines	9	10
peaches	484	186
pears	144	79
plums	26	36
other	16	9

Source: 1987 Census of Agriculture, U.S. Department of Commerce and New England Agricultural Statistics (USDA)

SPROUTS

CASH RECEIPTS: **$2,559,000 (estimated)**

MARKET OUTLET: **virtually all is wholesaled to supermarkets and restaurants.**

Massachusetts Sprout Production (estimated)

Producers	Production (lbs. per year)	Wholesale Cost (per lb.)	Value
8 bean	6,700,000	0.27	$1,809,000
8 alfalfa	750,000	1.00	$750,000

Sources: Department of Food and Agriculture and Massachusetts Cooperative Extension Service

TOBACCO

Outdoor And Shade Type Tobacco

ACRES: 458

FARMS: 21

County Distribution

COUNTY	FARMS PRODUCING	ACRES
Franklin	5	withheld
Hampshire	5	217
Hampden	11	withheld
Total	21	458

Outdoor Type Production Trend

Year	Yield/Acre Pounds	Production 1,000 Pounds
1985	1,960	255
1986	1,925	250
1987	1,800	198
1988	1,850	185
1989	1,850	185

Shade Type Production Trend

Year	Yield/Acre Pounds	Production 1,000 Pounds
1985	1,460	526
1986	1,095	372
1987	1,110	455
1988	1,385	582
1989	1,150	449

Source: 1987 Census of Agriculture (USDC) and New England Agricultural Statistics (USDA)

VEGETABLES AND POTATOES

ACREAGE: **18,728 (total) 16,100 (vegetables) 2,628 (potatoes)**

FARMS PRODUCING: **1,008 (vegetables) 93 (potatoes)**

MARKET OUTLETS: Although a portion of vegetable production, mainly potatoes and cucumbers, reaches the process market, the largest portion is sold to the fresh market. Fresh market outlets include roadside stands, farmers' markets, grower cooperatives, restaurants, supermarkets and wholesale brokers.

Key Vegetable Growing Areas

Connecticut Valley - (Franklin and Hampshire counties) over 5,000 acres are cultivated in bottom land of the valley. The communities of Hadley, Hatfield, Whately and Deerfield delineate the core of this producing area. Major crops are potatoes, sweet corn, cucumbers, squashes, cabbage and onions. A portion of the potato and cucumber crop is produced for the process market.

Lower Connecticut Valley - (Hampden County) communities surrounding metropolitan Springfield cultivate nearly 2,000 acres. A large portion of the acreage lies in Agawam, Southwick and Westfield.

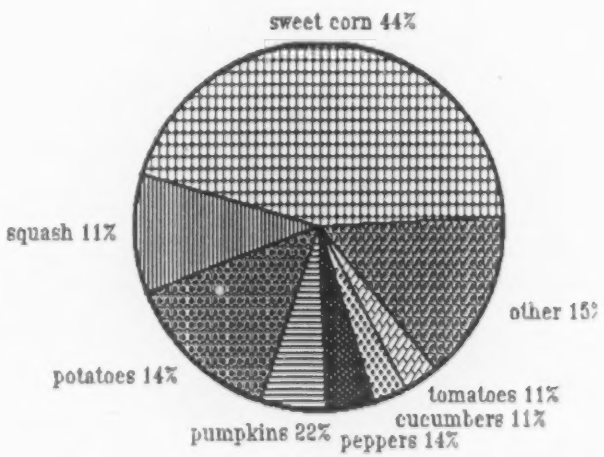
Southeastern Massachusetts - primarily Bristol and parts of Plymouth counties. Between the metropolitan regional markets of Boston and Providence, Rhode Island over 4,500 acres are cultivated in vegetables for the fresh market. Production clusters in communities near Dighton and Taunton. Major crops are sweet corn, butternut squash, pumpkins, beans, peppers and tomatoes.

Northeastern Massachusetts - (Essex, Middlesex, and eastern Worcester counties) over 3,500 acres are cultivated. Vegetable cultivation in this area is more randomly scattered and less pronounced than in other key areas, although Methuen, Concord, and Northborough are important growing sites. Growers emphasize sweet corn, pumpkins and salad crops and market primarily through roadside stands.

Major Vegetables Cultivated

Percent of Total Vegetable Acres

Sweet corn	44%
Squashes	11%
White potatoes	14%
Pumpkins	6%
Peppers	4%
Cucumber	3%
Tomatoes	3%
Other	15%



Vegetable Production Trends

POTATOES

	YIELD/ACRE CWT	TOTAL PRODUCTION 1,000 CWT
1985	250	825
1986	230	667
1987	235	658
1988	220	572
1989	240	600

TOMATOES

	YIELD/ACRE CWT	TOTAL PRODUCTION 1,000 CWT
1985	245	164
1986	215	127
1987	215	125
1988	185	105
1989	225	124

SWEET CORN

	YIELD/ACRE CWT	TOTAL PRODUCTION 1,000 CWT
1985	94	743
1986	94	790
1987	90	639
1988	91	655
1989	85	663

Source: 1987 Census Of Agriculture, U.S. Department Of Commerce And New England Agricultural Statistics (USDA) And Massachusetts Department Of Food And Agriculture

WINE GRAPES

VINEYARDS: 36

ACRES: 288 (vineyards range in size from 1/4 acre to over 60 acres)

MAJOR TYPES: significant plantings of vinifera varieties exist, however, French hybrids (crossing of vinifera varieties with American species) form the backbone of Massachusetts vineyards.

MARKET OUTLETS: Most of the current production goes to local wineries. Small amounts of grapes are sold to home winemakers and the fresh fruit market.

Key Growing Areas

Vineyards are currently found in 11 counties, however, over 75 percent of the planted acres are in Bristol, Plymouth, Barnstable, Dukes and Nantucket counties. There are also some smaller vineyards in Western Massachusetts where there is considerable experimentation with hybrid plantings.

COUNTY	COMMUNITIES	GROWERS	ACRES
Barnstable	1	1	9.00
Berkshire	1	1	4.50
Bristol	3	7	121.25
Dukes	2	2	31.00
Hampden	1	1	1.50
Hampshire	6	8	7.00
Middlesex	1	1	4.00
Nantucket	1	1	7.00
Norfolk	1	1	2.00
Plymouth	9	12	93.00
Worcester	2	2	5.00
TOTAL	28	36	288.75

Sources: Department of Food and Agriculture, Massachusetts Cooperative Extention Service, Massachusetts vineyard owners and the New England Wine Council

APIARIES

NUMBER OF COLONIES:

Colonies primarily in honey production:	**9,557**
Estimated pounds of honey produced per colony:	**20**
Migratory colonies primarily used for pollination:	**13,350**

Migratory Colonies

More than 13,350 colonies are used to ensure pollination and improve crop yields. Many of the rental colonies are managed by migratory beekeepers. After pollination season, these beekeepers transport their hives to apiary yards in southern states to permit their honey bees to rebuild in warmer climates.

Distribution of Apiaries and Colonies

Geography	Apiaries	Resident Colonies	Migratory Colonies
Western Massachusetts			
Berkshire	161	390	0
Franklin	219	578	0
Hampshire	163	626	0
Hampden	179	804	0
Region Total	722	2,398	0
Central Massachusetts			
Worcester	674	1,808	0
Region Total	674	1,808	0
Eastern Massachusetts			
Essex	323	1,308	0
Middlesex	439	1,089	2,000
Suffolk	13	41	0
Norfolk	312	1,301	0
Bristol	241	700	3,857
Plymouth	335	500	7,143
Region Total	1,663	4,939	13,000
Cape Cod an the Islands			
Barnstable	112	226	0
Dukes	25	161	0
Nantucket	2	25	350
Region Total		412	350
Massachusetts Total	3,198	9,557	13,350

Source: Massachusetts Department Of Food And Agriculture

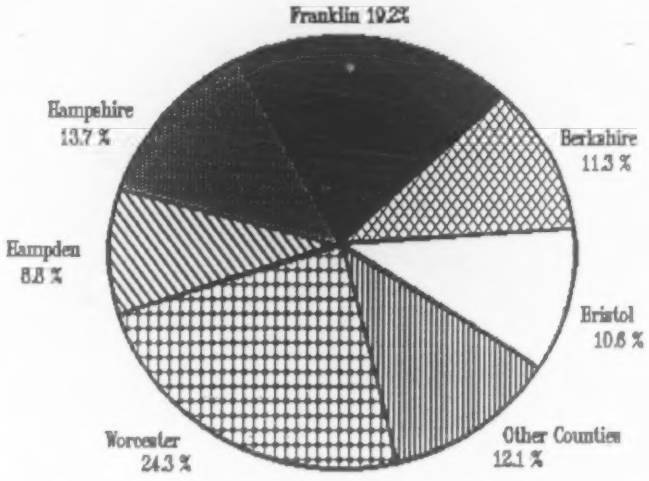
DAIRY

Massachusetts Dairy Farms Selling Milk, 1989
expressed as a percent of

Region / County	Farms	Herd Size	Percent of State Annual Milk Production
Western Massachusetts			
Berkshire	51	5,070	15
Franklin	87	6,847	17
Hampshire	62	4,813	12
Hampden	40	3,420	10
Region Total	240	20,150	54
Central Massachusetts			
Worcester	110	9,151	24
Region Total	110	9,151	24
Eastern Massachusetts			
Essex	15	1,259	3
Middlesex	14	1,241	4
Suffolk	0	0	0
Norfolk	9	353	
Bristol	48	3,962	11
Plymouth	14	1,013	2
Region Total	100	7,828	21
Cape Cod And The Islands			
Barnstable	1	30	
Dukes	2	111	
Nantucket	0	0	0
Region Total	141		
Massachusetts Total	453	37,270	100

Source: Massachusetts Department Of Food And Agriculture

Dairy Farms Selling Milk by County



Massachusetts Manufactures of Milk Products

INDUSTRY	FIRMS (NUMBER)	EMPLOYEES (1,000)	PAYROLL (MILLION DOLLARS)	VALUE ADDED (MILLION DOLLARS)	VALUE OF SHIPMENT (MILLION DOLLARS)	NEW CAPITAL EXPENDITURES (MILLION DOLLARS)
FLUID MILK	34	2.7	61.7	277.4	774.7	9.8
ICE CREAM AND FROZEN DESSERTS	34	1.1	26.2	36.0	251.6	SUPPRESSED

SOURCE: 1987 CENSUS OF MANUFACTURES, U.S. DEPARTMENT OF COMMENT OF COMMERCE

POULTRY

Massachusetts Poultry Inventory

Inventory		Massachusetts
Any poultry	farms	918
Chickens 3 months old or older	farms	738
	number	1,502,202
Hens and pullets of laying age	farms	733
	number	1,502,202
1987 farms by inventory		
1 to 99		610
100 to 399		67
400 to 3,199		32
3200 to 9,999		5
10,000 to 19,999		6
20,000 to 49,999		5
50,000 to 99,999		5
100,000 or more		3
Pullets 3 months old or older not of laying age	farms	95
	number	250,846
Pullet chicks and pullets under 3 months old	farms	35
	number	156,034
Broilers and other meat-type chickens	farms	101
	number	13,561
Turkeys	farms	148
	number	2,140
Turkey hens kept for breeding	farms	25
	number	2,140
Ducks, geese and other poultry	farms	299

Source: 1987 Census of Agriculture, U.S. Department of Commerce

Distribution of the Massachusetts Poultry Industry

Geography	Farms With Any Poultry (number)	Chickens 3 months old or older (number)
Massachusetts	918	1,502,202
WESTERN MASSACHUSETTS		
Berkshire	50	153,423
Franklin	83	17,585
Hampshire	83	4,826
Hampden	89	24,563
Region Total	305	200,397
CENTRAL MASSACHUSETTS		
Worcester	188	1,014,621
Region Total	188	1,014,621
EASTERN MASSACHUSETTS		
Essex	74	51,258
Middlesex	90	85,075
Norfolk	36	5,149
Suffolk	0	0
Bristol	99	130,005
Plymouth	79	3,682
Region Total	378	275,169
CAPE COD AND THE ISLANDS		
Barnstable	25	suppressed
Dukes	20	suppressed
Nantucket	2	suppressed
Region Total	47	not available

Source: 1987 Census of Agriculture, U.S. Department of Commerce

AGRICULTURAL PRESERVATION RESTRICTION PROGRAM

FARMLAND PROTECTED: 272,025,484 acres
(1980-1989)

FUNDS APPROPRIATED: $67,597,943
(1980-1989)

Geographic Distribution of APR Dollars

Eastern Massachusetts	41%
Cape Cod & the Islands	7%
Western Mass.	26%
Central Mass.	28%

Regional Distribution of Agricultural Preservation Restriction (APR) Dollars invested, parcels and acreage, 1980-1989

Geography	Parcels	(%)	Acres	(%)	Dollars	(%)	Dollar Avg./Acre
State	272	(100)	25,484	(100)	67,597,943	(100)	2,653
Western	114	(42)	10,601	(42)	17,187,485	(26)	1,621
Central	70	(26)	8,337	(33)	18,790,800	(28)	2,254
Eastern	81	(30)	6,059	(24)	27,902,158	(41)	4,605
Cape	7	(2)	487	(1)	3,717,500	(3)	7,633

Chronological Summary of the Agricultural Preservation Restriction Program, 1980-1987

year	parcels enrolled	acres	funds invested	avg. acre cost
1980	12	1,144	$2,376,325	$2,077
1981	21	1,863	$3,701,900	$1,987
1982	28	2,311	$2,890,775	$1,251
1983	31	3,286	$5,033,060	$1,532
1984	28	2,335	$4,430,200	$1,897
1985	31	3,338	$5,080,900	$3,338
1986	54	4,271	$17,078,700	$3,999
1987	14	1,486	$2,252,000	$1,515
1988	24	2,452	$8,500,770	$3,467
1989	29	2,998	$16,253,313	$5,421
Total	272	25,484	$67,597,943	$2,653

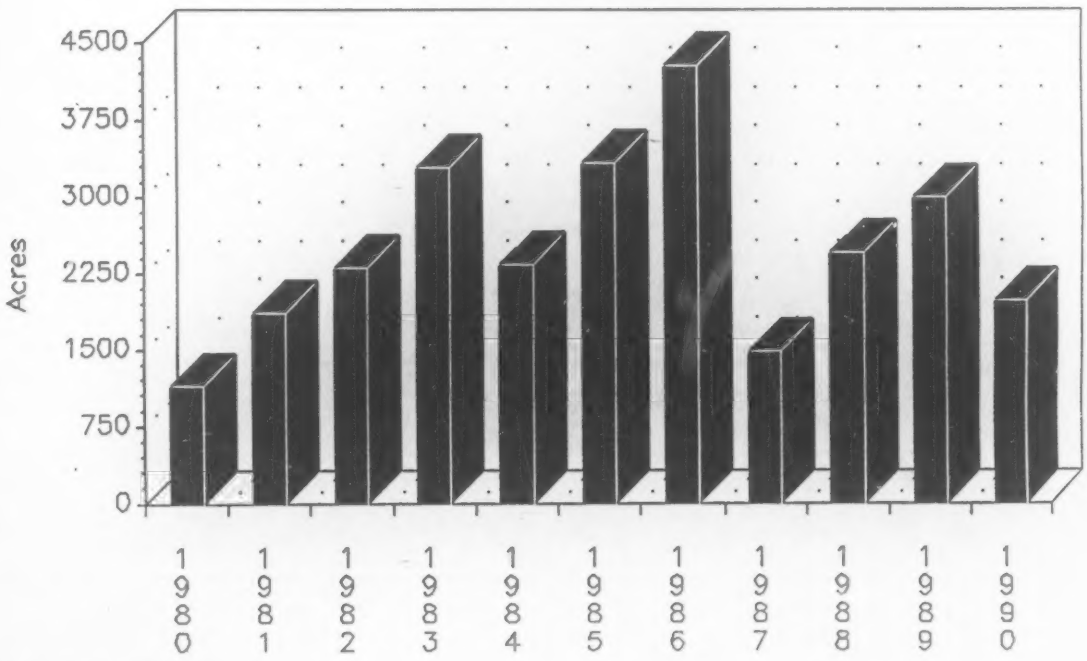
(1) Includes state and municipal funds
Source: Department of Food and Agriculture, February, 1988

Distribution of APR Dollars as a Percent for Selected Commodities In Massachusetts, 1980 - 1989

Commodity	Parcels	(%)	Acres	(%)	Dollars	(%)	Dollar Avg./Acre
State Total	272	(100)	25,484	(100)	67,597,943	(100)	2,653
LIVESTOCK							
Dairy	81.5	(30)	11,174.5	(44)	23,210,200	(35)	2,077
Livestock	5	(2)	650	(3)	2,290,000	(3)	3,523
Equine	4	(1)	373.5	(1)	1,510,200	(2)	4,043
Livestock Total	90.5	(33)	12,198	(48)	27,010,400	(40)	2,214
CROPS							
Forage	95.5	(35)	7,382.5	(29)	16,090,200	(24)	2,180
Vegetables	61	(23)	3,847	(15)	15,971,743	(24)	4,152
Tree Fruit	19.5	(7)	1,620	(6)	6,807,900	(10)	4,202
Small Fruit	5.5	(2)	426.5	(2)	1,717,700	(2)	3,935
Crops Total	181.5	(67)	13,286	(52)	40,587,543	(60)	3,055

MASSACHUSETTS AGRICULTURAL PRESERVATION RESTRICTION PROGRAM, 1980–1990

Acres Preserved



Source: Massachusetts Department of Food and Agriculture
1990 figures estimated

COMPOST

Massachusetts On-Farm Composting

The Massachusetts Department of Food and Agriculture is encouraging on-farm composting as a management strategy for farm generated materials as well as for appropriate non-farm-generated organic materials such as leaves, manures and food procwssing by - products that otherwise have gone to disposal in landfills or incerators. The Farms in the following table are handling in excess of 200 tons per year.

Region	Farms Composting	Tons Per Year
Western Massachusetts	3	4,500
Central Massachusetts	2	30,100
Eastern Massachusetts	7	25,500
State Total	12	60,100

Source: Massachusetts Department of Food and Agriculture

DIRECT MARKETING

In the broad view of American agriculture, the output of Massachusetts is a minor part of the national whole. Massachusetts agriculture, however, is significant because it has one of the best markets in the country: a high percentage of high income consumers. Commercial farms, therefore, usually specialize in crops of high value such as market vegetables, fruits, nursery materials and more for direct consumption. Many farmers are ingenious individuals who study market possibilities and develop a specialty to satisfy a particular need. For example, there are gardeners who raise an assortment of exotic vegetables exclusiveluy for chinese restaurants and food shops. There are those who produce sod for landscape contractors, flowers for wholesale florists, and game birds for gourmet restaurants and delicatessens. Farmers may have their own sales stand or direct contact with wholesale or other retail outlets. The direct market is for many Massachusetts farmers a particular advantage.

The pages that follow present the state-wide distribution pattern of two direct marketing outlets; roadside stands and farmers' markets. Although not apparent from the table, the propensity for roadside stands is greatest near fruit and vegetable growing areas in close proximity to consumers in urban areas. Farmers' markets, however, are generally located in population centers.

FARMERS' MARKETS

Region County / Community	Markets / Week (Number)	Season (Weeks)	Farmers Selling* (number)
Western Massachusetts			
BERKSHIRE COUNTY			
Great Barrington	1	23	1
North Adams	1	13	2
Pittsfield	2	26	15
Williamstown	1	15	6
FRANKLIN COUNTY			
Greenfield	1	26	12
HAMPSHIRE COUNTY			
Amherst	1	30	16
Easthampton	1	15	5
Huntington	1	21	5
Northampton	1	29	15
HAMPDEN COUNTY			
Chicopee	1	17	6
Holyoke	1	26	18
Springfield			
(Avacado)	1	26	10
(Civic Center)	1	26	10
Westfield	1	21	4
Region Total	15	314	-
Central Massachusetts			
WORCESTER COUNTY			
Barre	1	25	20
Fitchburg	2	15	6
Gardner	1	24	7
Holden	1	16	6
Shrewsbury	1	15	2
Southbridge	1	18	2
Spencer	1	16	3
Worcester	3	21	10
Region Total	11	150	-

* Average number of farmers selling per week.
Source: Massachusetts Department of Food and Agriculture

FARMERS' MARKETS *(continued)*

Region County / Community	Markets / Week (Number)	Season (Weeks)	Farmers Selling * (Number)
Eastern Massachusetts			
ESSEX COUNTY			
Beverly	1	16	3
Haverhill	1	18	6
Lawrence	1	20	10
Lynn	1	8	4
Peabody	1	-	8
Newburyport	1	20	6
Topsfield	1	11	15
Wenham	1	15	7
West Newbury	1	10	2
MIDDLESEX COUNTY			
Cambridge	1	21	12
Framingham	1	18	2
Lowell	1	21	8
Newton	1	17	25
Somerville	1	16	8
NORFOLK COUNTY			
Brookline	1	20	18
Franklin	1	15	6
Quincy	1	20	8
Weymouth	1	-	-
SUFFOLK COUNTY			
City Hall Plaza	2	18	10
Brighton	1	14	3
Copley Square	2	18	6
Fields Corner	1	14	3
Jamaica Plain	1	20	3
Mission Hill	1	14	3
Roslindale	1	20	4
South End	1	16	2
BRISTOL COUNTY			
Fall River	2	28	18
New Bedford	1	16	2
PLYMOUTH COUNTY			
Brockton			
(City Hall)	1	10	3
(Fairgrounds)	1	16	3
Hanson	1	-	-
Hingham	1	20	5
Middleboro	1	15	8
Region Total	36	-	-

* Average number of farmers selling per week

Source: Massachusetts Department of Food Agriculture

FARMERS' MARKETS *(continued)*

Region County / Community	Markets / Week (Number)	Season (Weeks)	Farmers Selling* (Number)
Cape Cod and the Islands			
BARNSTABLE COUNTY			
Falmouth	1	-	4
Barnstable (Hyannis)	1	-	-
DUKES COUNTY			
Oak Bluffs	1	12	7
West Tisbury	1	16	25
NANTUCKET COUNTY			
Nantucket	6	25	2
Region Total	10	-	-
State Total	72	-	-

* Average number of farmers selling per week.
Source: Massachusetts Department of food and Agriculture

ROADSIDE STANDS/PICK-YOUR OWN

The following figures represent roadside marketers of vegetables, fruits, christmas trees, maple syrup, dairy products, eggs, turkeys and other farm produce. Most farm stands are seasonal operations, however some stands are lengthening thier marketing season with the addition of new products through farm-based food processing. Pies, pre-cooked turkeys, apple cider and ice cream are examples of added-value processing which enables farmers to diversify their product line.

County	Communities	Establishments
WESTERN MASSACHUSETTS		
Berkshire	9	10
Franklin	10	24
Hampshire	9	24
Hampden	17	55
TOTAL	45	113
CENTRAL MASSACHUSETTS		
Worcester	31	62
TOTAL	31	62
EASTERN MASSACHUSETTS		
Essex	19	39
Middlesex	36	92
Suffolk	1	1
Norfolk	18	49
Plymouth	24	81
Bristol	16	83
TOTAL	114	345
CAPE COD AND THE ISLANDS		
Barnstable	9	21
Dukes	4	8
Nantucket	1	2
TOTAL	14	31
STATE TOTAL	204	551

MASSACHUSETTS STATE-OWNED FARMLAND LEASING

In Massachusetts 84 farmers or agricultural educational institutions are leasing 4,480 acres of state-owned farmland in 63 locations across the state. Seven agencies issue these leases or use permits. The Department of Food and Agriculture leases land under its care and control and also leases land for other agencies under Chapter 20 of the Massachusetts General Laws.

The Massachusetts Farmlands Stewardship Committee, formed by the Department of Food and Agriculture in September of 1987, is looking at additional ways to protect and improve the management of state-owned farmland. One technique under consideration is the long-term (30 year) leasing of state-owned land to farmers. This is now being done under the Department of Mental Retardation's lease of the Belchertown State School farmstead to the New England Small Farm Institute.

Leasing Agency	Acres leased	Farmers/Institutions renting	Locations
Food and Agriculture	981	16	12
Fisheries and Wildlife	1,833	40	24
Environmental Mgt.	592	18	18
Massport	166	1	1
Corrections	80	1	1
Mental Health	294	3	3
Mental Retardation	534	5	4
TOTAL	4,480	84	63

MASSACHUSETTS DEPARTMENT OF FOOD AND AGRICULTURE BUDGET

Appropriations

ACCOUNT #	CATEGORY	1988 FY AMOUNT	1989 FY AMOUNT	1990 FY AMOUNT	1991 FY AMOUNT
2511-0100	Administration	602,411	586,528	579,798	596,200
2511-3000	Regulatory	1,874,468	1,882,313	1,603,286	1,615,000
2511-3001	Alar Research	50,000			
2511-3002	IPM	400,000	360,000	360,000	360,000
2511-4000	Ag. Development	1,047,336	1,041,037	943,270	1,002,200
2515-1000	Animal Health	716,143	705,386	645,119	648,000
2518-1000	Fairs	693,069	661,184	561,184	517,603
2518-2500	Equine	173,504	169,211	123,179	98,084
2518-3000	Thoroughbred	0	0	0	0
2518-4000	Tufts Vet School	0	0	0	0
2518-5000	Standardbreds	175,000	0	0	0
2520-0100	Reclamation Board	99,806	99,892	89,431	0
	SUB-TOTAL DFA	5,831,737	5,505,551	4,905,267	4,837,087
2520-0100	RECLAMATION BOARD	0	0	0	42,000
	Mosquito Control Projects	3,345,753	3,253,071	3,388,005	3,388,005
	SUB-TOTAL DFA WITH MOSQUITO PROJECTS	9,177,490	8,758,622	8,293,272	8,267,092

Retained Revenues

2511-3005	Rights of Way	0	0	200,000	200,000
2518-3001	Thoroughbreds	900,000	900,000	301,814	800,000
2518-4001	Tufts	200,000	200,000	0	200,000
2518-6000	Greyhounds	300,000	300,000	275,000	300,000
	SUB-TOTAL RETAINED REVENUES	1,400,000	1,400,000	776,814	1,500,000

MASSACHUSETTS AGRICULTURAL STATISTICS

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LIVESTOCK HIGHLIGHTS

INVENTORY

The inventory of cattle and calves in Massachusetts on January 1, 1989 totaled 70,000 head, unchanged from the record low on January 1, 1988. This inventory consisted of 30,000 milk cows, 10,000 beef cows, 13,000 heifers 500 pounds and over, 5,000 steers and bulls, and 12,000 calves. The 1988 calf crop (calves born) of 37,000 head was 20 percent lower than in 1987. The inventory value on January 1, 1989 averaged $655 per head, $30 more than on January 1, 1988, but $145 lower than the record high on January 1, 1982. Total inventory value rose 5 percent from the previous year to $45.9 million due to an increase in average value per head.

Inventory of sheep and lambs totaled 14,000 head on January 1, 1989, the same number as a year earlier. This inventory had a value of $1.6 million, or $115 per head. This compares with a total of $1.6 million, and a per head value of $113 a year earlier. The lamb crops in 1987 and 1988 totaled 11,000 lambs born.

Massachusetts hogs and pigs on December 1, 1988 numbered 31,000 head, down about 6 percent from December 1 of the previous year. However, total inventory value dropped about 12 percent to $2,511,000, as the average value per head dropped $5.00 from 1987 to $81.00. The Massachusetts pig crop numbered 37,300 head in 1988, a decrease of 1,700 head from 1987.

PRODUCTION AND MARKETINGS

The 1988 marketings of cattle numbered 32,000 head, with total live weight of 9.94 million pounds, down 15.5 million pounds from 1987. The number of cattle marketed was down 15,000 head from a year ago; and the number of calves marketed decreased 8,000 head from 1987. Farmers received an average price of $56.00 and $72.00 per cwt. for cattle and calves respectively during 1988. Cattle prices were up $6.00 per cwt. and calf priced rose $9.00 per cwt. above previous year.

Wool production during 1988 totaled 88,000 pounds, down 18 percent from the 1987 amount. All of the decrease was because of a decrease in the number of sheep shorn, as average weight per fleece increased from 7.1 to 8.0 pounds. Number of sheep shorn was 11,000 in 1988 and 15,000 in 1987. Total value of the wool produced in 1988 was $73,000, down from $85,000 in 1987. Average price received for wool was 83 cents per pound in 1988, 4 cents higher than the preceding year. Production of lamb and mutton in 1988 totaled 901,000 pounds live weight, down 50,000 from 1987, while marketings increased to 804,000 pounds in 1988 from 795,000 pounds in 1987. Gross income from 1988 marketings was $607,000.

Massachusetts pork producers marketed nearly 8.6 million pounds of pork in 1988, up about 5 percent from 1987. However, gross income fell to 3.7 million despite the higher volume marketed as the average price received dropped $8 from 1987 to $41.00 per cwt.

Massachusetts 1988 mink pelt production totaled 10,700, down 1,400 pelts from year-earlier levels of 12,100 pelts. Of the pelts produced in 1988, 20 percent were Standard, 12 percent were Pastel, 23 percent were Pearl and 45 percent were other colors. Mink females bred to produce kits in 1989, at 2,400, showed a decrease of 400 from the previous year.

CATTLE: Number and Value of All Cattle and Calves on Farms January 1, Massachusetts, 1978 - 1989

YEAR	NUMBER	VALUE	
		PER HEAD	TOTAL
	1,000	Dollars	1,000 Dollars
1978	99	415	41,085
1979	102	560	57,120
1980	104	690	71,760
1981	104	785	81,640
1982	98	800	78,400
1983	103	700	72,100
1984	98	595	58,310
1985	100	565	56,500
1986	100	560	56,000
1987	85	570	48,450
1988	70	625	43,750
1989	70	655	45,850

CATTLE: January 1, Inventory by Classes, Massachusetts, 1978 - 1989

YEAR	ALL CATTLE AND CALVES	COWS & HEIFERS THAT HAVE CALVED		HEIFERS 500 LBS. & OVER			STEERS 500 LBS.+	BULLS 500 LBS.+	STEERS, HEIFERS & BULLS -500 LBS.
				REPLACEMENTS		OTHER			
		BEEF	MILK	BEEF COW	MILK COW				
	1,000								
1978	99	8	51	2	16	1	2	2	17
1979	102	10	49	3	16	1	2	2	19
1980	104	9	46	3	16	1	3	2	24
1981	104	10	45	4	14	1	4	2	24
1982	98	10	47	3	13	1	3	2	19
1983	103	10	49	2	17	1	3	2	19
1984	98	8	50	2	14	1	2	2	19
1985	100	9	47	3	15	1	3	2	20
1986	100	10	46	3	15	1	3	2	20
1987	85	11	37	2	14	1	3	1	16
1988	70	10	33	2	8	1	3	1	12
1989	70	10	30	3	9	1	4	1	12

CATTLE AND CALVES: Production and Income, Massachusetts, 1978 - 1988

YEAR	PRODUCTION	MARKETINGS	PRICE PER 100 POUNDS		VALUE OF HOME CONSUMPTION	GROSS INCOME
			CATTLE	CALVES		
	1,000 Pounds		Dollars		1,000 Dollars	
1978	27,080	26,560	41.90	57.00	1,441	12,846
1979	22,058	21,858	57.00	76.00	1,471	14,258
1980	24,650	22,830	55.00	71.00	1,892	14,651
1981	21,650	21,610	50.00	63.00	1,290	12,424
1982	17,310	9,390	45.00	57.00	1,548	6,022
1983	20,080	22,930	42.00	52.00	1,646	11,483
1984	20,090	14,910	42.00	52.00	1,659	8,137
1985	16,990	14,890	40.00	46.00	1,192	7,334
1986	18,680	29,060	42.00	53.00	1,226	13,728
1987	15,620	25,480	50.00	63.00	1,440	14,570
1988	10,810	9,940	56.00	72.00	1,635	7,553

CATTLE AND CALVES: Inventory, Supply and Disposition, Massachusetts, 1978 - 1988

YEAR	ALL CATTLE ON HAND JAN. 1	CALF CROP	INSHIPMENTS	MARKETINGS		FARM SLAUGHTER CATTLE & CALVES	DEATHS	
				CATTLE	CALVES		CATTLE	CALVES
				1,000				
1978	99	50	5	23	19	2	2	6
1979	102	47	1	19	18	1	2	6
1980	104	45	1	21	14	1	3	7
1981	104	47	1	20	23	1	3	7
1982	98	48	1	10	23	1	3	7
1983	103	48	1	23	23	1	2	5
1984	98	50	1	16	24	1	2	6
1985	100	51	1	13	31	1	2	5
1986	100	47	1	29	27	1	2	4
1987	85	46	1	25	30	1	2	4
1988	70	37	1	10	22	1	2	3

HOGS: Number and Value on Farms, December 1, Massachusetts, 1977 - 1988

	NUMBER			VALUE	
	BREEDING	MARKET	TOTAL	PER HEAD	TOTAL
		Head		Dollars	1,000 Dollars
1977	8,000	52,000	60,000	59.50	3,570
1978	8,000	52,000	60,000	76.50	4,590
1979	9,000	51,000	60,000	55.50	3,330
1980	7,000	42,000	49,000	74.50	3,651
1981	6,000	43,000	49,000	79.50	3,896
1982	7,000	39,000	46,000	88.50	4,071
1983	7,000	35,000	42,000	79.00	3,318
1984	5,000	35,000	40,000	78.50	3,140
1985	5,000	29,000	34,000	89.00	3,026
1986	4,000	28,000	32,000	90.00	2,880
1987	5,000	28,000	33,000	86.00	2,838
1988	4,000	27,000	31,000	81.00	2,511

HOGS: Pig Crop, Sows Farrowed and Pigs Saved, Massachusetts, 1978 - 1988

YEAR	SPRING CROP (DEC - MAY)			FALL CROP (JUN - NOV)			TOTAL PIG CROP
	SOWS	PIGS / LITTER	PIGS SAVED	SOWS	PIGS / LITTER	PIGS SAVED	
			H e a d				
1978	5,000	7.2	36,000	6,000	6.8	41,000	77,000
1979	6,000	6.5	39,000	6,500	6.5	42,000	81,000
1980	4,000	7.4	30,000	6,000	5.8	35,000	65,000
1981	4,000	6.6	26,000	5,000	6.4	32,000	58,000
1982	3,700	7.5	28,000	4,500	7.6	34,000	62,000
1983	4,900	6.5	32,000	4,000	7.0	28,000	60,000
1984	3,700	6.9	26,000	3,700	6.5	24,000	50,000
1985	3,200	6.2	20,000	3,000	6.5	20,000	40,000
1986	3,000	6.3	19,000	2,800	6.8	19,000	38,000
1987	2,500	7.1	18,000	3,000	7.1	21,000	39,000
1988	2,600	6.4	16,700	3,000	6.9	20,600	37,300

HOGS: Inventory Number, Pig Crop and Disposition, Massachusetts, 1978 - 1988

YEAR	ON HAND DEC 1st PREVIOUS YEAR	PIG CROP		MARKETINGS	FARM SLAUGHTER	DEATHS
		DEC - MAY	JUN - NOV			
			H e a d			
1978	60,000	36,000	41,000	71,000	1,000	5,000
1979	60,000	39,000	42,000	76,000	1,000	4,000
1980	60,000	30,000	35,000	71,000	2,000	3,000
1981	49,000	26,000	32,000	55,000	1,000	2,000
1982	49,000	28,000	34,000	61,000	1,000	3,000
1983	46,000	32,000	28,000	59,000	2,000	3,000
1984	42,000	26,000	24,000	49,000	1,000	2,000
1985	40,000	20,000	20,000	42,000	1,000	3,000
1986	34,000	19,000	19,000	37,000	1,000	2,000
1987	32,000	18,000	21,000	35,000	1,000	2,000
1988	33,000	16,700	20,600	36,000	1,500	1,800

HOGS: Production and Income, Massachusetts, 1978 - 1988

YEAR	PRODUCTION	MARKETINGS	PRICE PER 100 POUNDS	VALUE OF HOME CONSUMPTION	GROSS INCOME
	1,000 Pounds		Dollars	1,000 Dollars	
1978	17,211	16,640	45.00	304	7,792
1979	18,640	17,820	44.00	297	8,138
1980	16,412	16,185	37.00	500	6,488
1981	13,267	12,825	43.00	290	5,805
1982	14,547	14,380	54.00	316	8,081
1983	11,651	11,010	42.00	378	5,002
1984	9,745	9,600	46.00	269	4,685
1985	9,836	9,630	41.00	314	4,262
1986	9,000	8,715	46.00	207	4,216
1987	8,963	8,195	49.00	221	4,237
1988	8,606	8,551	41.00	208	3,714

POULTRY HIGHLIGHTS

EGGS

Laying flocks in Massachusetts produced 262 million eggs during 1988, compared to 273 million a year earlier. Daily rate of lay averaged 73.4, up from the 1987 rate of 70.8. The average price per dozen was 93 cents, a 3 cent increase from the previous year. Total value of egg production was $20 million, unchanged from 1987.

CHICKENS

As of December 1, 1988, the total number of chickens was 1.2 million, an 8 percent decrease from the 1.3 million in 1987. Of the total, hens and pullets accounted for 80 percent of the birds, compared with 70 percent in 1987. Total value of chickens in 1988 was $2.2 million, a decline from 1987's value of $2.6 million. Price per bird was $1.85, a 25 cents decrease from $2.10 in 1987.

TURKEYS

Turkeys raised during 1988 totaled 150,000 birds, up 10,000 from 1987. Production was 3.0 million pounds live weight in 1988, compared to 2.8 a year earlier. Average value per pound was $1.02, a 3 cent increase from 1987. Aggregate value of the turkeys raised was $3.1 million, up from $2.8 million the previous year.

POULTRY: Inventory by Class and Value, Massachusetts, December 1, 1977 - 1988

YEAR	CHICKENS, EXCLUDING BROILERS						VALUE PER HEAD	TOTAL VALUE
	HENS AND PULLETS OF LAYING AGE		PULLETS NOT OF LAYING AGE		OTHER	TOTAL		
	HENS	PULLETS	3 MONTHS AND OLDER	UNDER 3 MONTHS				
	1,000						Dollars	1,000 Dollars
1977	465	1,005	290	180	50	1,990	2.05	4,080
1978	550	620	196	174	40	1,580	2.05	3,239
1979	617	755	126	197	31	1,726	2.15	3,711
1980	644	811	108	209	18	1,790	2.30	4,117
1981	650	622	141	153	37	1,603	2.55	4,088
1982	742	458	156	166	18	1,540	2.55	3,927
1983	595	514	110	138	21	1,378	2.45	3,376
1984	651	450	160	225	34	1,520	2.60	3,952
1985	360	680	192	109	24	1,365	2.85	3,890
1986	500	630	30	130	20	1,310	1.95	2,555
1987	305	585	134	222	24	1,270	2.10	2,667
1988	417	541	38	182	24	1,202	1.85	2,224

HATCH: Egg-type Chicks by Commercial Hatcheries, New England, 1981 - 1988

MONTH	1981	1982	1983	1984	1985	1986	1987	1988
				1,000				
JANUARY	1,767	1,102	1,626	1,911	1,670	1,700	1,075	1,111
FEBRUARY	1,837	1,230	1,370	1,828	1,580	1,456	1,080	1,222
MARCH	2,024	1,685	1,008	2,385	1,709	1,695	1,190	1,127
APRIL	2,060	2,015	1,947	2,299	2,137	1,664	1,945	1,216
MAY	1,954	2,221	2,018	1,981	1,858	1,803	1,542	1,407
JUNE	1,970	1,763	2,070	2,269	1,689	1,766	1,227	1,448
JULY	1,676	1,646	1,716	1,891	1,465	1,327	764	1,211
AUGUST	1,647	1,368	1,687	1,862	1,814	1,229	989	1,037
SEPTEMBER	1,748	1,426	1,894	1,613	1,635	1,464	1,405	763
OCTOBER	1,896	1,603	1,669	2,034	1,777	1,784	1,851	580
NOVEMBER	1,538	1,512	1,797	1,912	1,718	1,273	1,500	494
DECEMBER	1,467	1,740	2,094	1,909	1,732	1,737	1,539	358
ANNUAL	21,584	19,311	21,896	23,894	20,784	18,898	16,107	11,974

EGGS: Production and Value, Massachusetts, 1978 - 1988

YEAR	EGGS PRODUCED	PRICE PER DOZEN	VALUE OF PRODUCTION
	Million	Cents	1,000 Dollars
1978	341	66.2	18,812
1979	339	73.8	20,849
1980	326	74.5	20,239
1981	321	86.0	23,005
1982	314	84.0	21,980
1983	265	91.0	20,096
1984	268	109.0	24,344
1985	257	98.0	20,988
1986	315	94.0	24,675
1987	273	90.0	20,475
1988	262	93.0	20,305

TURKEYS: Production and Value, Massachusetts, 1978 - 1988

YEAR	NUMBER RAISED	POUNDS PRODUCED	PRICE PER POUND	VALUE OF PRODUCTION
	1,000	1,000 Pounds	Cents	1,000 Dollars
1978	146	2,993	68	2,035
1979	140	2,800	65	1,820
1980	126	2,470	78	1,926
1981	145	3,045	77	2,345
1982	145	3,089	77	2,378
1983	160	3,312	84	2,782
1984	152	3,314	83	2,750
1985	156	3,229	86	2,777
1986	145	3,103	91	2,824
1987	140	2,800	99	2,772
1988	150	3,000	102	3,060

EGGS: Total Production by Quarters and Annual, Massachusetts, 1978 - 1988

QUARTER	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
						Million					
DEC-FEB 1/	83	81	81	80	81	70	68	64	80	72	62
MAR-MAY	91	88	82	83	82	65	70	61	83	72	68
JUN-AUG	84	85	79	77	78	65	67	62	78	67	68
SEP-NOV	83	85	84	81	73	65	63	70	74	62	64
ANNUAL	341	339	326	321	314	265	268	257	315	273	262

1/ December previous year

CHICKENS: Lost, Sold and Value of Sales, Massachusetts, 1978 - 1988

YEAR	NUMBER LOST	SOLD		PRICE PER POUND	VALUE OF SALES
		NUMBER	LIVEWEIGHT		
	1,000		1,000 Pounds	Cents	1,000 Dollars
1978	130	1,300	7,150	12.3	885
1979	100	900	4,950	13.2	660
1980	107	1,150	6,325	8.3	529
1981	91	1,650	9,075	9.0	822
1982	104	880	4,840	8.0	391
1983	86	989	5,440	10.5	576
1984	81	708	3,894	16.5	651
1985	77	1,107	6,089	12.0	731
1986	92	1,168	6,190	9.0	557
1987	77	1,072	5,896	9.0	531
1988	81	717	3,585	5.0	179

POULTRY: Average Number of Layers by Quarters and Annual, Massachusetts, 1978 - 1988

QUARTER	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
						1,000					
DEC-FEB 1/	1,430	1,330	1,331	1,365	1,345	1,155	1,089	1,040	1,189	1,176	904
MAR-MAY	1,496	1,433	1,330	1,318	1,340	1,036	1,083	964	1,255	1,130	1,012
JUN-AUG	1,373	1,411	1,321	1,209	1,272	1,027	1,031	997	1,177	998	1,026
SEP-NOV	1,353	1,374	1,397	1,323	1,230	1,030	1,034	1,105	1,156	924	951
ANNUAL	1,413	1,387	1,345	1,303	1,297	1,062	1,059	1,026	1,195	1,056	973

EGGS: Daily Rate of Lay by Quarters and Annual, Massachusetts, 1978 - 1988

QUARTER	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
						Percent					
DEC-FEB 1/	64.5	67.7	67.6	65.1	66.9	67.3	69.4	68.4	74.8	68.0	75.4
MAR-MAY	66.1	66.7	67.0	68.5	66.5	68.2	70.3	68.8	71.9	69.3	73.0
JUN-AUG	66.5	65.5	65.0	69.2	66.7	68.8	70.6	67.6	72.0	73.0	72.0
SEP-NOV	67.4	68.0	66.1	67.3	65.2	69.4	67.0	69.6	70.3	73.7	74.0
ANNUAL	66.1	67.0	66.2	67.4	66.3	68.5	69.1	68.6	72.2	70.8	73.4

SHEEP AND LAMBS: Inventory Numbers, Lamb Crop and Disposition, Massachusetts, 1978 - 1988

YEAR	ALL SHEEP AND LAMBS ON HAND JAN. 1	LAMB CROP	MARKETINGS		FARM SLAUGHTER SHEEP & LAMBS	DEATHS SHEEP & LAMBS
			SHEEP	LAMBS		
			Head			
1978	6,800	5,300	1,000	2,900	500	1,000
1979	6,700	5,500	800	2,000	500	900
1980	10,000	7,200	2,600	3,800	600	1,200
1981	9,000	7,500	100	3,200	900	1,300
1982	11,000	9,100	3,300	5,200	300	1,300
1983	10,000	8,200	900	5,000	200	1,100
1984	11,000	10,000	2,000	6,500	300	1,200
1985	11,000	8,500	3,000	5,000	500	1,000
1986	10,000	11,000	0	4,900	600	1,500
1987	14,000	11,000	3,300	5,600	700	1,400
1988	14,000	11,000	2,900	6,100	300	1,700

SHEEP AND LAMBS: Production and Income, Massachusetts, 1978 - 1988

YEAR	PRODUCTION	MARKETINGS	PRICE PER 100 POUNDS		VALUE OF HOME CONSUMPTION	GROSS INCOME
			SHEEP	LAMBS		
	1,000 Pounds		Dollars		1,000 Dollars	
1978	406	329	38.00	84.00	67	282
1979	474	210	39.00	85.00	82	215
1980	586	573	42.00	77.00	89	416
1981	479	170	45.00	100.00	89	252
1982	602	654	41.00	94.00	68	465
1983	708	465	36.00	93.00	80	453
1984	801	720	36.00	96.00	91	644
1985	699	689	40.00	106.00	135	638
1986	932	334	41.00	104.00	142	490
1987	951	795	39.00	95.00	140	664
1988	901	804	34.00	90.00	86	607

SHEEP AND LAMBS: Inventory Number by Class and Value, January 1, Massachusetts, 1978 - 1989

YEAR	LAMBS			ONE YEAR AND OVER		ALL SHEEP & LAMBS	VALUE	
	ALL LAMBS	EWES	WETHERS AND RAMS	EWES	WETHERS AND RAMS		PER HEAD	TOTAL
	Head						Dollars	1,000 Dollars
1978	1,600	1,100	500	4,700	500	6,800	53.50	364
1979	1,300	1,000	300	4,900	500	6,700	63.00	422
1980	2,500	2,000	500	7,000	500	10,000	78.00	780
1981	2,000	1,600	400	6,400	600	9,000	88.00	792
1982	2,600	2,000	600	8,000	400	11,000	109.00	1,199
1983	2,600	2,000	600	7,000	400	10,000	104.00	1,040
1984	2,200	1,700	500	8,000	800	11,000	103.00	1,133
1985	2,400	1,700	700	8,000	600	11,000	121.00	1,331
1986	2,300	1,700	600	7,000	700	10,000	122.00	1,220
1987	3,700	2,200	1,500	9,500	800	14,000	110.00	1,540
1988	3,800	2,000	1,800	9,200	1,000	14,000	113.00	1,582
1989	3,400	2,300	1,100	8,700	900	14,000	115.00	1,610

WOOL: Production and Value, Massachusetts, 1978 - 1988

YEAR	SHEEP SHORN	WEIGHT PER FLEECE	SHORN WOOL PRODUCTION	PRICE PER POUND	VALUE
	Head	Pounds	1,000 Pounds	Cents	1,000 Dollars
1978	6,300	6.8	43	74	32
1979	7,000	6.9	48	84	40
1980	9,000	6.9	62	88	55
1981	10,000	6.9	69	90	62
1982	10,000	6.8	68	66	45
1983	11,000	6.9	76	63	48
1984	10,000	7.3	73	67	49
1985	10,000	7.1	71	62	44
1986	12,000	7.1	85	59	50
1987	15,000	7.1	107	79	85
1988	11,000	8.0	88	83	73

MINK: Production and Females Bred to Produce Kits, Massachusetts, 1984 - 1989

COLOR CLASS	PELTS PRODUCED					FEMALES BRED TO PRODUCE KITS				
	1984	1985	1986	1987	1988	1985	1986	1987	1988	1989
Standard	2,200	2,200	2,500	1,000	2,100	710	600	1,200	500	600
Demi-Buff	5,900	5,300	1/	4,100	1/	1,200	700	1/	600	1/
Pastel	1,600	1,300	1,200	1,200	1,300	470	500	1/	1/	1/
Pearl	3,500	1/	3,100	3,000	2,500	880	1/	800	800	650
Others	2,400	5,100	5,000	2,800	4,800	740	1,400	1,900	900	1,150
TOTAL	15,600	13,900	11,900	12,100	10,700	4,000	3,200	3,900	2,800	2,400

1/ Included in others to avoid disclosing individual operations.

DAIRY HIGHLIGHTS

PRODUCTION AND MARKETINGS

Milk production on Massachusetts farms totaled a record low 463 million pounds in 1988, 43 million pounds below 1987. The number of milk cows decreased to a record low average of 32,000 head, down 3,000 from the 1987 average. The number of milk cows has generally been on the decline since 1924's record high average of 148,000 head. However, the rate of production set a record high 14,469 pounds per cow. This continues the long term upward trend, up 12 pounds from a year ago.

Dairymen used 6 million pounds of milk to feed calves and 2 million pounds for home use in 1988. Both the amount utilized for home use and fed to calves remained unchanged from the previous year. Four hundred and fifty-five million pounds were marketed, with an average price received of $13.80 per cwt. during 1988. Milk marketed decreased by 43 million pounds and the average price received per cwt. was down 36 cents from the previous year. The decrease in the amount of milk marketed and in average price of milk resulted in 1988 cash receipts of only $62.8 million, $7.75 million below the 1987 cash receipts.

MANUFACTURED DAIRY PRODUCTS

Massachusetts dairy plants manufactured a combined total of 45.3 million gallons of ice cream and milk sherbet for 1988, an 11 percent decrease from last year's yield of 50.8 million gallons. Ice cream production totaled 43.0 million gallons, 12 percent below 1987 levels. Milk sherbet production totaled 2.29 million gallons, 18 percent higher than in 1987.

MILK: Production and Value, Massachusetts, 1978 - 1988

YEAR	AVERAGE NUMBER OF MILK COWS	PRODUCTION					
		PER MILK COW		PERCENTAGE OF FAT IN ALL MILK PRODUCED	TOTAL		VALUE OF MILK PRODUCED
		MILK	MILKFAT		MILK	MILKFAT	
	1,000	Pounds		Percent	Million Pounds		1,000 Dollars
1978	49	11,673	428	3.67	572	21	68,526
1979	48	11,792	429	3.64	566	21	75,160
1980	46	12,391	447	3.61	570	21	81,150
1981	46	12,565	456	3.63	578	21	87,349
1982	47	12,809	466	3.64	602	22	90,273
1983	48	12,771	469	3.67	613	23	92,359
1984	48	11,938	445	3.73	573	21	84,912
1985	47	12,660	471	3.72	595	22	83,837
1986	42	13,310	498	3.74	559	21	77,003
1987	35	14,457	542	3.75	506	19	71,665
1988	32	14,469	545	3.77	463	18	63,881

MANUFACTURED DAIRY: PRODUCTION MAJOR FROZEN PRODUCTS, MASSACHUSETTS, 1978 - 1988

YEAR	ICE CREAM	ICE MILK	MILK SHERBET
	1,000 Pounds	1,000 Gallons	
1978	42,909	9,779	2,102
1979	42,463	10,454	1,829
1980	43,986	9,817	1,992
1981	43,193	10,173	2,089
1982	44,444	6,574	2,198
1983	44,510	9,138	2,297
1984	46,862	7,802	2,155
1985	46,992	7,442	1,991
1986	45,186	6,792	1,733
1987	48,826	1/	1,947
1988	43,019	1/	2,294

1/ Estimate discontinued.

MILK SOLD TO PLANTS: Monthly and Annual Average Price Per 100 Pounds Received By Farmers, Massachusetts, 1978 - 1988

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVERAGE
						Dollars							
1978	11.10	11.20	11.00	10.70	10.70	10.60	11.00	11.60	12.10	12.70	12.90	12.70	11.50
1979	12.70	12.80	12.50	12.20	12.00	12.00	12.50	13.10	13.40	13.80	13.90	13.40	12.80
1980	13.60	13.40	13.30	13.00	13.00	12.80	13.30	13.70	14.20	14.70	14.80	14.70	13.70
1981	14.90	14.70	14.50	14.30	14.00	13.80	14.30	14.60	14.90	15.20	15.00	14.80	14.60
1982	14.90	14.70	14.50	14.20	13.80	13.70	14.20	14.60	14.90	15.00	15.10	14.80	14.50
1983	14.80	14.80	14.40	14.30	13.90	13.80	14.20	14.70	14.90	15.10	15.20	14.60	14.60
1984	14.60	14.30	14.10	13.90	13.80	13.60	14.00	14.50	14.90	15.30	15.40	14.90	14.40
1985	14.90	14.60	14.10	13.60	13.20	12.70	13.20	13.40	13.60	13.80	13.80	13.60	13.70
1986	13.40	13.30	13.00	12.70	12.60	12.50	13.10	13.70	14.10	14.50	14.70	14.40	13.40
1987	14.40	14.10	13.50	13.10	12.60	12.60	13.20	13.60	14.20	14.40	14.30	13.80	13.70
1988	13.70	13.30	12.80	12.40	12.10	11.90	12.50	13.20	13.80	14.40	14.80	14.70	13.30

MILK: Quantities Used and Marketed by Farmers, Massachusetts, 1978 - 1988

YEAR	TOTAL PRODUCED	MILK, USED ON FARMS WHERE PRODUCED			MILK MARKETED BY FARMERS		
		USED FOR MILK, CREAM AND BUTTER	FED TO CALVES	TOTAL	SOLD TO PLANTS AND DEALERS	SOLD DIRECTLY TO CONSUMERS	TOTAL
		Million Pounds					
1978	572	5	5	10	530	32	562
1979	566	4	6	10	525	31	556
1980	570	4	6	10	530	30	560
1981	578	4	5	9	540	29	569
1982	602	3	5	8	565	29	594
1983	613	2	8	10	575	28	603
1984	573	2	8	10	540	23	563
1985	595	2	8	10	565	20	585
1986	559	2	5	7	535	17	552
1987	506	2	6	8	480	18	498
1988	463	2	6	8	439	16	455

MILK: Quantity Marketed, Price and Cash Receipts, Massachusetts, 1978 - 1988

YEAR	SOLD TO PLANTS			SOLD DIRECTLY TO CONSUMERS			COMBINED MARKETINGS		
	QUANTITY	PRICE PER CWT.	CASH RECEIPTS	QUANTITY	PRICE PER QUART	CASH RECEIPTS	QUANTITY	PRICE PER CWT.	CASH RECEIPTS
	Million Pounds	Dollars	1,000 Dollars	Million Quarts	Cents	1,000 Dollars	Million Pounds	Dollars	1,000 Dollars
1978	530	11.50	60,950	14.9	43	6,400	562	11.98	67,350
1979	525	12.80	67,200	14.4	46	6,633	556	13.28	73,833
1980	530	13.70	72,610	14.0	51	7,116	560	14.24	79,726
1981	540	14.60	78,840	13.5	53	7,149	569	15.11	85,989
1982	565	14.50	81,925	13.5	53	7,149	594	15.00	89,074
1983	575	14.60	83,950	13.0	53	6,902	603	15.07	90,852
1984	540	14.40	77,760	10.7	53	5,670	563	14.82	83,430
1985	565	13.70	77,405	9.3	54	5,023	585	14.09	82,428
1986	535	13.40	71,690	7.9	55	4,349	552	13.78	76,039
1987	480	13.70	65,760	8.4	57	4,772	498	14.16	70,532
1988	439	13.30	58,387	7.4	59	4,391	455	13.80	62,778

MILK PRODUCTION, by Quarters and Annual, Massachusetts, 1978 - 1988

YEAR	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC	ANNUAL
			Million Pounds		
1978	145	149	140	138	572
1979	143	148	138	137	566
1980	143	149	138	140	570
1981	143	152	142	141	578
1982	150	156	146	150	602
1983	156	159	147	151	613
1984	151	145	135	142	573
1985	150	152	145	148	595
1986	153	150	128	128	559
1987	132	133	120	121	506
1988	123	119	110	111	463

MILK COWS: Average Number on Farms, by Quarters and Annual, Massachusetts, 1978 - 1988

YEAR	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC	ANNUAL
			1,000		
1978	50	48	48	49	49
1979	49	48	47	46	48
1980	46	46	46	46	46
1981	45	46	47	47	46
1982	47	47	46	47	47
1983	49	49	46	48	48
1984	49	48	47	47	48
1985	47	47	46	46	47
1986	46	44	39	37	42
1987	37	36	34	34	35
1988	33	32	31	30	32

MILK PRODUCTION: Average per Cow, by Quarters and Annual, Massachusetts, 1978 - 1988

YEAR	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC	ANNUAL
			Pounds		
1978	2,900	3,110	2,920	2,820	11,673
1979	2,920	3,090	2,940	2,980	11,792
1980	3,110	3,240	3,000	3,050	12,391
1981	3,180	3,295	3,020	3,000	12,565
1982	3,190	3,320	3,180	3,185	12,809
1983	3,190	3,245	3,200	3,150	12,771
1984	3,080	3,020	2,880	3,020	11,938
1985	3,190	3,230	3,150	3,220	12,660
1986	3,320	3,400	3,285	3,460	13,310
1987	3,570	3,700	3,530	3,560	14,457
1988	3,730	3,720	3,550	3,700	14,469

CROP HIGHLIGHTS

CORN SILAGE

Corn silage production in the Commonwealth totaled 644,000 tons in 1988, 2 percent above the 1987 silage crop. Growers planted 39,000 acres to corn in 1988, 1,000 acres short of the previous season. Hot, humid conditions during August contributed to excellent yields, averaging 19.5 tons per acre. Massachusetts farmers chopped 33,000 acres for silage, with the crop valued at $17.1 million.

HAY

Hay output from Massachusetts farms totaled 292,000 tons in 1988, up fractionally from the previous year's crop. Dry conditions produced a light first crop, but provided excellent haymaking conditions. Timely rains rejuvenated second and third crop growth, however forced growers to chop instead of bale in many areas. Hay yields averaged 2.32 tons per acre, up 1 percent from the previous year.

Alfalfa and alfalfa mixtures comprised 27 percent of all hay production, weighing in at 78,000 tons. Other hay output totaled 214,000 tons, up fractionally from 1987 production.

The 1988 hay crop was valued at $29.2 million, 9 percent above the 1987 value.

TOBACCO

Massachusetts broadleaf and shade tobacco output totaled 767,000 pounds in 1988, 17 percent above 1987 production. Broadleaf yields averaged 1,850 pounds per acre from 100 acres which placed production 7 percent under the previous year. Increased acreage and yield for shade type tobacco placed production 28 percent above 1987 output.

CORN: Acreage, Production and Value, Massachusetts, 1978 - 1988

YEAR	ACRES PLANTED FOR ALL PURPOSES	SILAGE			
		ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION	PRODUCTION VALUE
	1,000		Tons	1,000 Tons	1,000 Dollars
1978	45	40	16.5	660	14,850
1979	44	39	17.0	663	16,575
1980	45	40	17.0	680	19,380
1981	46	39	20.0	780	19,968
1982	46	39	17.0	663	18,763
1983	43	39	17.0	663	19,956
1984	45	40	15.5	620	18,724
1985	46	39	19.0	741	22,230
1986	43	36	18.0	648	18,144
1987	40	34	18.5	629	17,298
1988	39	33	19.5	644	17,066

HAY: Alfalfa and All Other, Acreage and Production, Massachusetts, 1978 - 1988

YEAR	ALFALFA HAY			ALL OTHER HAY		
	ACRES HARVESTED	YIELD PER ACRE	PRODUCTION	ACRES HARVESTED	YIELD PER ACRE	PRODUCTION
	1,000 Acres	Tons	1,000 Tons	1,000 Acres	Tons	1,000 Tons
1978	28	2.60	73	92	2.15	198
1979	27	2.90	78	92	2.25	207
1980	27	2.40	65	88	2.10	185
1981	28	2.80	78	90	2.15	194
1982	29	2.80	81	90	2.25	203
1983	29	3.00	87	94	2.40	226
1984	30	2.80	84	96	2.25	216
1985	30	2.90	87	91	2.10	191
1986	29	3.10	90	98	2.40	235
1987	30	2.60	78	97	2.20	213
1988	31	2.50	78	95	2.25	214

HAY: All, Acreage, Production and Value, Massachusetts, 1978-1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	PRODUCTION	PRICE PER TON	VALUE OF PRODUCTION
	1,000 Acres	Tons	1,000 Tons	Dollars	1,000 Dollars
1978	120	2.26	271	73.00	19,783
1979	119	2.39	285	72.00	20,520
1980	115	2.17	250	76.00	19,000
1981	118	2.31	272	80.00	21,760
1982	119	2.39	284	89.00	25,276
1983	123	2.54	313	92.00	28,796
1984	126	2.38	300	95.00	28,500
1985	121	2.30	278	94.00	26,132
1986	127	2.56	325	90.00	29,250
1987	127	2.29	291	92.00	26,772
1988	126	2.32	292	100.00	29,200

TOBACCO, Shade-grown: Acreage, Production and Value, Massachusetts, 1978 - 1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION 2/	PRICE PER POUND	VALUE OF PRODUCTION
		Pounds	1,000 Pounds	Dollars	1,000 Dollars
1978	860	1,300	1,118	7.50	8,385
1979	770	1,400	1,078	8.50	9,163
1980	940	1,475	1,387	9.80	13,593
1981	900	1,575	1,418	10.00	14,180
1982	250	1,200	300	12.50	3,750
1983	170	1,470	250	11.00	2,750
1984	350	1,400	490	12.50	6,125
1985	360	1,460	526	12.65	6,654
1986	340	1,095	372	13.10	4,873
1987	410	1,110	455	15.50	7,053
1988	420	1,385	582	21.20	12,338

TOBACCO, Outdoor 1/: Acreage, Production and Value, Massachusetts, 1978 - 1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION 2/	PRICE PER POUND	VALUE OF PRODUCTION
		Pounds	1,000 Pounds	Dollars	1,000 Dollars
1978	170	2,000	340	1.10	374
1979	220	1,850	407	1.20	488
1980	250	2,000	500	1.31	655
1981	240	2,300	552	1.40	773
1982	300	1,840	552	1.35	745
1983	255	2,090	533	1.40	746
1984	150	1,965	295	1.55	457
1985	130	1,960	255	1.60	408
1986	130	1,925	250	1.60	400
1987	110	1,800	198	1.70	337
1988	100	1,850	185	1.70	315

1/ Predominantly Havana Seed grown prior to 1987. Broadleaf tobacco grown in 1987.
2/ Excludes tobacco leaves harvested and destroyed for any reason.

FRUIT, POTATO AND VEGETABLE HIGHLIGHTS

FRUIT

Massachusetts cranberry growers surpassed all records in 1988, weighing in at 1.861 million barrels. Production exceeded the previous year's output by 28 percent, and the previous record set in 1986 by 3 percent. Excellent bloom, heavy berry set, large berry sizing and good harvesting conditions all contributed to the high quality, high yielding crop.

Commercial apple production totaled 2.4 million bushels (42-pound units) in 1988, 3 percent above the previous year's crop. Full crop potential was limited by dry summer conditions and localized hail damage. Hail, heavy drop and labor shortages contributed to an estimated 2 million pounds left unharvested. The alar scare in late February of 1989 significantly hurt the apple market, forcing growers to dump an estimated 1 million pounds. Value of the 1988 crop totaled $21.7 million, 12 percent above the previous year.

Peach growers in Massachusetts harvested 46,000 bushels (48-pound units) in 1988, 10 percent above 1987 output. The value of utilized 1987 production totaled $1,155 million, 11 percent above the previous year.

POTATOES

Potato production in Massachusetts totaled 572,000 cwt. in 1988, down 13 percent from the previous year. Yields were below average in 1988 due to a hot, dry growing season, as well as high infestations of Colorado potato beetles. Excessive stress on the crop resulted in medium to small sized tubers and average to light set. Value of the 1988 crop was placed at $4.4 million, 3 percent above the previous year's value.

VEGETABLES

Production of tomatoes for fresh market sales totaled 105,000 cwt. in 1988, 16 percent less than in 1987. A decrease in the average price per hundredweight from $65 to $55 between 1987 and 1988 lowered the value of production to $5.8 million, a 29 percent decrease. Production of sweet corn for fresh market sales in 1988 totaled 655,000 cwt., a 3 percent rise from 1987. Yield per acre, at 91 cwt., and acres harvested, at 7,200, both were higher in 1988 than in 1987 and contributed to the increase in total amount produced. Average price received per cwt., of $17.70 was up from $15.80 in 1987. Value of the crop produced in 1988 totaled $11.6 million, 15 percent higher than the 1987 crop's value.

CRANBERRIES: Acreage, Production, Utilization and Value, Massachusetts, 1978 - 1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION 1/	UTILIZATION			SEASON AVERAGE PRICE PER BARREL 3/	VALUE OF UTILIZED PRODUCTION 4/
				FRESH SALES	PROCESSED	SHRINKAGE 2/		
		Barrels	1,000 Barrels				Dollars	1,000 Dollars
1978	11,200	105.4	1,180	247	833	100	21.60	25,488
1979	11,200	96.4	1,080	130	880	70	26.60	28,728
1980	11,200	105.8	1,185	110	1,016	59	33.50	39,698
1981	11,200	104.6	1,172	205	875	92	41.50	48,639
1982	11,200	114.9	1,287	169	998	120	46.30	59,588
1983	11,200	126.9	1,421	177	1,217	27	51.70	73,466
1984	11,200	148.5	1,663	170	1,442	51	54.50	90,634
1985	11,300	149.3	1,687	167	1,472	48	54.80	92,448
1986	11,300	160.4	1,813	159	1,529	125	44.80	81,222
1987	11,800	122.8	1,449	143	1,277	29	44.40	64,336
1988	11,800	157.7	1,861	151	1,678	32	46.30	86,164

1/ Includes cranberries that were put in set aside under the Cranberry Marketing Order.
2/ Berries paid for by processors and lost because of dehydration and berry breakdown after delivery.
3/ Equivalent return at first delivery point, screen basis.
4/ Excludes cranberries that were put in set aside under the Cranberry Marketing Order.

APPLES: Production and Value, Massachusetts, 1978 - 1988

YEAR	TOTAL PRODUCTION 1/	UTILIZED PRODUCTION	PRICE PER UNIT	VALUE OF UTILIZED PRODUCTION
	1,000 42-Pound Units		Dollars	1,000 Dollars
1978	2,500	2,500	5.80	14,490
1979	2,262	2,262	6.51	14,725
1980	2,381	2,381	6.11	14,550
1981	1,976	1,976	8.35	16,501
1982	2,381	2,381	7.26	17,290
1983	2,310	2,310	7.10	16,403
1984	2,310	2,310	7.82	18,063
1985	2,119	2,024	7.70	15,594
1986	2,262	2,190	8.24	18,048
1987	2,286	2,238	8.63	19,319
1988	2,357	2,286	9.48	21,660

1/ Estimates relate to production in orchards of 100 or more trees.

PEACHES: Production and Value, Massachusetts, 1978 - 1988

YEAR	TOTAL PRODUCTION	UTILIZED PRODUCTION	PRICE PER UNIT	VALUE OF UTILIZED PRODUCTION
	1,000 48-Pound Units		Dollars	1,000 Dollars
1978	38	38	13.74	522
1979	38	38	15.16	576
1980	42	42	14.29	600
1981	4	4	17.50	70
1982	31	31	21.77	675
1983	35	35	22.34	782
1984	40	40	19.00	760
1985	44	44	19.57	861
1986	40	38	23.04	864
1987	42	42	24.76	1,040
1988	46	44	26.25	1,155

POTATOES: Acreage, Production and Value, Massachusetts 1978 - 1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION	AVERAGE PRICE PER CWT.	VALUE OF PRODUCTION
		Cwt.	1,000 Cwt.	Dollars	1,000 Dollars
1978	3,600	225	810	6.30	5,103
1979	3,400	220	748	5.60	4,189
1980	3,400	220	748	7.50	5,610
1981	3,300	225	743	5.40	4,012
1982	3,800	205	779	3.90	3,038
1983	3,400	190	646	7.20	4,651
1984	2,900	200	580	5.40	3,132
1985	3,300	250	825	3.40	2,805
1986	2,900	230	667	6.70	4,469
1987	2,800	235	658	6.50	4,277
1988	2,600	220	572	7.70	4,404

TOMATOES: Acreage, Production and Value, Massachusetts, 1978 - 1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION	AVERAGE PRICE PER CWT.	VALUE OF PRODUCTION
		Cwt.	1,000 Cwt.	Dollars	1,000 Dollars
1978	550	210	116	21.80	2,529
1979	510	190	97	24.60	2,386
1980	680	210	143	21.70	3,103
1981	760	215	163	20.10	3,276
1982	660	220	145	30.00	4,350
1983	570	165	94	30.00	2,820
1984	660	230	152	27.00	4,104
1985	670	245	164	27.00	4,428
1986	590	215	127	55.00	6,985
1987	580	215	125	65.00	8,125
1988	570	185	105	55.00	5,775

SWEET CORN: Acreage, Production and Value, Massachusetts, 1978 - 1988

YEAR	ACRES HARVESTED	YIELD PER ACRE	TOTAL PRODUCTION	AVERAGE PRICE PER CWT.	VALUE OF PRODUCTION
		Cwt.	1,000 Cwt.	Dollars	1,000 Dollars
1978	7,200	88	634	7.00	4,438
1979	7,700	84	647	8.99	5,817
1980	8,200	88	722	9.09	6,563
1981	8,800	85	748	11.71	8,752
1982	7,700	88	678	14.00	9,492
1983	8,700	92	800	13.30	10,640
1984	8,100	88	713	14.50	10,339
1985	7,900	94	743	12.80	9,510
1986	8,400	94	790	17.50	13,825
1987	7,100	90	639	15.80	10,096
1988	7,200	91	655	17.70	11,594

MAPLE SYRUP

The production of maple syrup during the 1988 season in Massachusetts totaled 44,000 gallons, 57 percent more than the previous season. The increase in production from previous year was due to both a higher yield per tap and more taps. The season was reported as being favorable, and it had a 30 day duration. The average opening date was March 1, with a closing date of March 30. The sweetness of sap was lower than normal with a reported average of 47 gallons of sap to make a gallon of syrup. The color of syrup was mostly medium to light. The 1988 maple crop averaged a record high $33.10 per gallon compared to $31.80 per gallon for maple syrup produced in 1987. The value of production for 1988 season totaled $1.46 million, up $566,000 from the 1987 crop. The increase in value from the previous year was due both to a higher production and a higher price.

MAPLE SYRUP: Production and Value, Massachusetts, 1978 - 1988

YEAR	PRODUCTION	SEASON AVERAGE PRICE PER GALLON	VALUE OF PRODUCTION
	1,000 Gallons	Dollars	1,000 Dollars
1978	28	14.10	395
1979	30	15.90	477
1980	20	18.40	368
1981	50	18.70	935
1982	48	20.20	970
1983	32	20.90	669
1984	43	20.60	886
1985	42	22.10	928
1986	30	25.10	753
1987	28	31.80	890
1988	44	33.10	1,456

MAPLE SYRUP: Prices by Type of Sale and Size of Container, Massachusetts, 1978 - 1988

YEAR	RETAIL					WHOLESALE					ALL SALES EQUIVALENT PER GALLON
	GAL	1/2 GAL	QUART	PINT	1/2 PINT	GAL	1/2 GAL	QUART	PINT	1/2 PINT	
	Dollars										
1978	13.10	7.40	4.29	2.81	1.86	11.66	6.59	3.79	2.41	1.49	14.10
1979	14.88	8.37	4.84	3.12	2.13	12.53	7.13	4.09	2.66	1.77	15.90
1980	17.66	9.69	5.88	3.69	2.46	16.25	8.94	4.73	3.07	1.98	18.40
1981	18.69	10.73	6.23	4.07	2.59	16.44	9.39	5.39	3.33	2.01	18.70
1982	19.39	11.31	6.61	4.20	2.68	16.38	9.87	5.41	3.46	2.13	20.20
1983	19.29	11.08	6.56	4.23	2.64	17.09	9.76	5.74	3.42	2.23	20.90
1984	19.40	11.16	6.56	4.28	2.66	16.80	9.54	5.48	3.50	2.25	20.60
1985	20.30	11.70	6.80	4.20	2.75	17.75	10.20	5.70	3.50	2.25	22.10
1986	22.85	13.00	7.60	4.70	3.15	20.40	11.60	6.85	4.05	2.65	25.10
1987	27.85	16.00	9.30	5.80	3.75	26.35	15.85	8.60	5.05	3.20	31.80
1988	31.50	17.25	10.10	6.15	3.95	27.30	15.85	9.00	5.20	3.20	33.10

PRICES PAID BY FARMERS: Index Numbers, Annual Average, United States, 1978 - 1988, by Years (1977 = 100)

YEAR	COMMODITIES & SERVICES, INTEREST, TAXES & WAGE RATES	PRODUCTION ITEMS INTEREST, TAXES & WAGE RATES	PRODUCTION ITEMS	INTEREST 1/	TAXES 2/	WAGE RATES FOR HIRED FARM LABOR
1978	108	109	108	117	100	107
1979	123	125	125	143	107	117
1980	138	139	138	174	115	127
1981	150	151	148	211	123	138
1982	159	158	153	242	124	144
1983	161	159	152	250	129	148
1984	164	161	155	248	133	151
1985	162	156	151	228	136	154
1986	159	150	144	211	138	160
1987	161	151	147	190	139	167
1988	170	160	157	186	142	172

1/ Interest on indebtedness secured by farm real estate.
2/ Taxes on farm real estate.

INDEX NUMBERS OF PRICES RECEIVED BY FARMERS, By Commodity Groups, U.S. Annual Ave., 1978 - 1988 (1977 = 100)

YEAR	CROPS								LIVESTOCK & PRODUCTS				ALL FARM PRODUCTS
	FOOD GRAINS	FEED GRAINS AND HAY	TOBACCO	COTTON	OIL BEARING CROPS	FRUIT	COM-MERCIAL VEGE-TABLES	TOTAL	DAIRY PROD-UCTS	POULTRY & EGGS	MEAT ANI-MALS	TOTAL	
1978	122	101	109	91	93	137	105	105	109	106	134	124	115
1979	147	114	118	96	103	144	110	116	124	111	166	147	132
1980	165	132	125	114	102	124	113	125	135	112	156	144	134
1981	166	141	140	111	110	130	136	134	142	116	150	143	139
1982	146	120	153	92	88	175	126	121	140	110	155	145	133
1983	148	143	155	104	102	128	130	128	140	118	147	141	135
1984	144	145	153	108	109	202	133	138	139	135	151	146	142
1985	133	122	153	93	84	180	129	120	131	119	142	136	128
1986	109	98	138	91	77	169	130	107	129	128	145	138	123
1987	103	85	129	99	79	181	144	106	129	107	163	146	126
1988	137	120	132	95	108	181	142	126	126	118	168	150	138

FARM PRODUCTION EXPENDITURES, Northeast 1/ and United States, 1988

EXPENDITURE 2/	NORTHEAST		UNITED STATES	
	AVERAGE PER FARM 3/	TOTAL EXPENDITURE 4/	AVERAGE PER FARM 3/	TOTAL EXPENDITURE 4/
	Dollars	Million Dollars	Dollars	Million Dollars
TOTAL FARM PRODUCTION EXPENDITURES	52,008	7,861	54,956	118,362
LIVESTOCK & POULTRY:	3,903	*590	6,318	13,607
Cattle Purchased	2,713	*410	5,171	11,138
Hogs & Pigs Purchased	519	*78	607	1,308
Poultry Purchased	460	*70	298	641
Sheep and Lambs Purchased	8	*1	87	*187
Other Livestock & Poultry Expenses	204	*31	154	333
FEED:	10,275	1,553	8,318	17,915
Grains	1,095	*166	1,733	3,732
Hays & Forages	614	93	903	1,945
Complete Rations or Formula Feeds	6,089	920	3,071	6,613
Protein Meals or Concentrates	1,749	264	1,603	3,454
Supplements	400	60	642	1,382
Minerals, Salts & Additives	328	50	366	788
FARM SERVICES:	8,187	1,237	11,436	24,630
Crop Custom Services	432	65	800	1,723
Livestock Custom Services	42	6	280	602
Transportation	933	141	514	1,108
Rent	1,516	229	4,652	10,020
Cash Rent	1,286	194	2,234	4,812
Share Rent	230	*35	2,418	5,208
Marketing & Storage Expenses	656	99	769	1,656
Insurance	1,168	176	1,282	2,761
Leasing 5/	142	21	206	444
Miscellaneous Farm Business Expenses 6/	792	120	893	1,923
Utilities	1,601	242	1,463	3,150
Electricity	1,392	210	1,230	2,650
AGRICULTURAL CHEMICALS & SPRAYS: 7/	1,240	187	1,792	3,859
FERTILIZER: 8/	2,466	373	3,230	6,958
Commercial Fertilizers	2,133	322	3,039	6,544

FARM PRODUCTION EXPENDITURES, Northeast 1/ and United States, 1988 (continued)

EXPENDITURE 2/	NORTHEAST		UNITED STATES	
	AVERAGE PER FARM 3/	TOTAL EXPENDITURE 4/	AVERAGE PER FARM 3/	TOTAL EXPENDITURE 4/
	Dollars	Million Dollars	Dollars	Million Dollars
INTEREST:	3,000	453	3,884	8,365
Farm Real Estate	2,309	349	2,656	5,721
Operating Loans	691	104	1,228	2,644
TAXES (PROPERTY & REAL ESTATE): 9/	1,998	302	1,824	3,928
LABOR EXPENSES:	7,128	1,077	4,747	10,224
Cash Wages	5,674	858	3,737	8,049
FUELS & LUBRICANTS:	1,766	267	2,006	4,450
Diesel	788	119	984	2,119
Gasoline - Bulk	430	65	446	961
Gasoline - Service Station	138	21	211	455
FARM SUPPLIES:	1,690	255	1,044	2.249
Supplies Used in Production	1,163	176	787	1,695
Containers Used for Marketing	527	*80	258	555
BUILDING & FENCING:	1,687	255	1,034	2,226
New Construction & Remodeling	1,189	180	698	1,503
FARM AND LAND IMPROVEMENTS:	444	67	438	943
New Construction	338	51	297	640
TOTAL FARM MACHINERY:	5,983	904	5,340	11,501
SEEDS AND PLANTS:	1,382	209	1,714	3,692
TRUCKS AND AUTOS:	666	101	956	2,058
Trucks including beds, hydr. systems, etc.	618	93	839	1,807

1/ Includes eleven states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.
2/ Farm share.
3/ Total expenditure divided by number of farms.
4/ Totals may not add, due to rounding.
5/ Includes equipment renting.
6/ Excludes telephone and water, but includes irrigation water cost.
7/ Excludes seed treatments.
8/ Includes materials and applications.
9/ Includes landiord expenditures.

CROP AND LIVESTOCK PRODUCTION: Rank Among States, Massachusetts and New England, 1988

ITEM	UNIT	MASSACHUSETTS			NEW ENGLAND		
		PRODUCTION	RANK	%U.S. TOTAL	PRODUCTION	RANK	%U.S. TOTAL
		1,000			1,000		
CROPS:							
Cranberries	barrels	1,861	1	45.6	n/a	n/a	n/a
Apples	42-pounds	2,357	11	1.1	8,273	8	3.8
Peaches, Freestone	48-pounds	46	32	.1	n/a	n/a	n/a
Corn for Silage	tons	644	29	.8	3,796	7	4.8
Hay, All	tons	292	43	.2	1,867	28	1.5
Potatoes, Fall	cwt.	572	20	.2	23,007	3	7.3
Tobacco	pounds	767	16	.06	3,738	14	.3
Sweet Corn	cwt.	655	6	4.6	n/a	n/a	n/a
Tomatoes	cwt.	105	18	.3	n/a	n/a	n/a
Maple Syrup	gallons	44	n/a	n/a	564	n/a	n/a
LIVESTOCK AND POULTRY:							
Eggs	each	262,000	37	.4	2,840,000	9	4.1
Milk	pounds	463,000	40	.3	4,377,000	9	3.0
Wool	pounds	88	35	.1	412	29	.5
Sheep	head	2.9	33	.2	13.4	20	1.0
Lambs	head	6.1	36	.1	33.7	29	.6
Hogs and Pigs	head	36	43	*	74.8	37	.1
Cattle	head	10	47	*	128	38	.3
Calves	head	22	43	.2	188.9	19	1.8

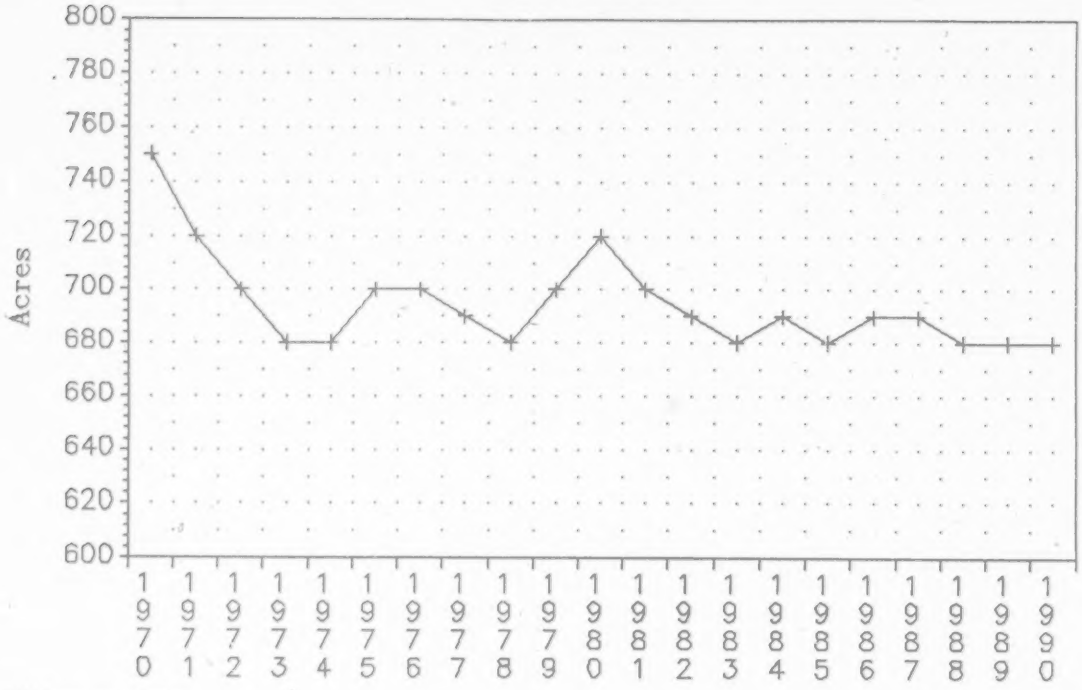
* Less than .05 percent

FARMS: Number and Land, Massachusetts and New England, 1977 - 1988 1/

YEAR	MASSACHUSETTS			NEW ENGLAND		
	NUMBER OF FARMS	AVERAGE SIZE	LAND IN FARMS	NUMBER OF FARMS	AVERAGE SIZE	LAND IN FARMS
		Acres	1,000 Acres		Acres	1,000 Acres
1977	6,200	111	690	28,300	182	5,155
1978	5,900	115	680	28,700	180	5,165
1979	6,200	113	700	29,900	173	5,165
1980	6,200	116	720	30,660	169	5,185
1981	6,100	115	700	30,920	169	5,225
1982	6,100	113	690	30,000	169	5,075
1983	6,300	108	680	30,420	167	5,075
1984	6,500	106	690	29,870	168	5,013
1985	6,500	105	680	29,470	165	4,863
1986	6,800	101	690	29,570	163	4,823
1987	6,800	101	690	29,170	161	4,683
1988	6,900	99	680	29,270	160	4,673

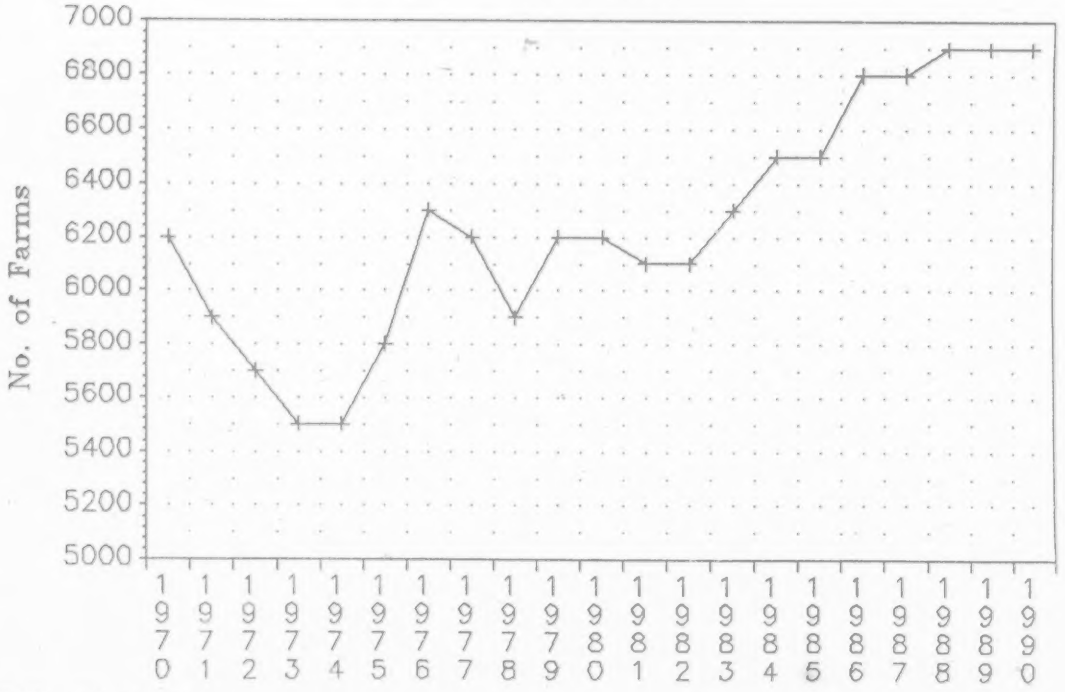
1/ A farm is a place as of June 1 that sells or could sell $1,000 of agricultural products during the year.

MASSACHUSETTS LAND IN FARMS
1970-1990



1990 figures are estimated

MASSACHUSETTS FARMS
1970-1990



1990 figures are estimated

UNITED STATES: Civilian Per Capita Consumption of Major Food Commodities (retail weight) 1/, 1980 - 1987 2/

COMMODITY	1980	1981	1982	1982	1984	1985	1986	1987 2/
				Pounds				
MEATS 3/	147.4	145.0	138.4	143.2	142.8	144.1	140.2	135.4
Beef	76.4	77.1	76.8	78.2	78.1	78.8	78.4	73.4
Veal	1.5	1.6	1.7	1.6	1.8	1.8	1.9	1.5
Lamb and Mutton	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.3
Pork	68.1	64.9	58.5	61.9	61.5	62.0	58.6	59.2
FISH (edible weight)	12.8	12.9	12.3	13.1	13.7	14.4	14.7	15.4
Canned	4.5	4.8	4.3	4.8	4.9	5.1	5.4	5.1
Fresh and Frozen	8.0	7.8	7.7	8.0	8.5	9.0	9.0	10.0
Cured	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
POULTRY PRODUCTS								
Eggs	34.4	33.5	33.5	33.0	32.9	32.9	31.7	31.6
Chicken (ready-to-cook)	49.8	51.3	52.7	53.4	55.2	57.6	58.7	62.7
Turkey (ready-to-cook)	10.5	10.7	10.8	11.2	11.3	12.1	13.3	15.1
DAIRY PRODUCTS								
Cheese (excluding cottage)	17.5	18.2	19.9	20.5	21.4	22.5	23.0	24.0
Fluid Whole Milk 4/	147.0	139.6	134.1	130.8	126.6	122.7	115.4	109.9
Fluid Lowfat Milk 5/	91.2	92.9	93.1	95.9	99.1	104.6	110.4	113.6
Fluid Cream 6/	3.4	3.4	3.5	3.6	4.0	4.3	4.6	4.7
Yogurt	2.6	2.5	2.6	3.2	3.7	4.0	4.3	4.6
Ice Cream (product weight)	17.5	17.4	17.6	18.0	18.1	18.1	18.4	18.3
FATS AND OILS (fat content only) 7/	57.2	57.7	58.2	60.0	58.6	64.0	64.1	62.7
Butter (product weight)	4.5	4.2	4.3	4.9	4.9	4.9	4.6	4.6
Margarine (product weight)	11.3	11.1	11.0	10.4	10.4	10.8	11.4	10.5
Shortening	18.4	18.2	18.5	18.6	18.5	21.2	22.8	22.0
Lard (direct use)	2.6	2.5	2.5	2.1	2.1	1.8	1.7	1.8
Edible tallow (direct use)	1.1	1.0	1.3	2.1	1.7	1.9	1.8	1.0
Salad and Cooking Oils	21.2	21.8	21.8	23.5	19.8	23.5	24.1	25.2

UNITED STATES: Civilian Per Capita Consumption of Major Food Commodities (retail weight) 1/, 1980 - 1987 2/

COMMODITY	1980	1981	1982	1982	1984	1985	1986	1987 2/
				Pounds				
FRUIT								
Selected Fresh Fruits 3/	86.4	83.1	83.7	88.4	87.8	86.3	93.2	98.6
Citrus	27.9	24.1	23.9	28.3	23.2	22.6	26.6	27.2
Apples	18.3	16.1	17.1	17.6	17.6	16.6	17.3	20.3
Other noncitrus	40.2	42.9	42.7	42.4	47.0	47.1	49.3	51.2
Canned Fruit 8/	10.7	10.0	9.7	9.2	8.9	8.5	8.4	8.7
Frozen Fruit	1.1	1.1	1.3	1.2	1.2	1.3	1.4	1.9
Dried Fruit	2.2	2.5	2.7	2.8	2.9	2.9	3.0	3.1
VEGETABLES								
Selected Fresh Vegetables 9/	72.8	71.5	74.2	74.7	78.8	78.8	79.9	78.6
Selected Vegetables for Processing 3/ 10/	105.2	100.2	98.5	100.4	108.6	104.4	103.4	104.2
Tomatoes for Processing 10/ 11/	63.6	59.3	60.1	60.8	68.4	63.1	63.4	64.6
Cucumbers for Pickling 10/	5.6	5.7	5.7	5.8	5.8	5.8	5.3	5.1
Other Vegetables for Canning 10/ 21/	21.4	20.7	19.2	19.0	17.0	18.7	19.0	17.4
Vegetables for Freezing 10/ 13/	14.6	14.6	13.6	14.8	17.4	16.9	15.8	17.1
POTATOES								
White Potatoes								
Fresh	49.0	43.8	44.8	47.9	46.8	44.7	47.6	45.1
Frozen	17.9	19.1	20.1	19.1	20.7	22.0	22.0	23.2
Canned	1.2	1.1	1.2	1.2	1.1	1.2	1.1	1.1
Dehydrated	1.3	1.5	1.4	1.4	1.4	1.6	1.5	1.5
Chips and Shoestrings	4.1	4.1	4.2	4.4	4.4	4.3	4.5	4.3
Sweet Potatoes 10/	4.4	4.7	5.4	4.7	4.7	5.3	4.8	4.4
GRAINS								
Wheat Flour 14/	116.8	115.8	116.7	117.4	118.1	123.3	123.6	128.0
Rice	9.4	11.0	11.8	9.7	8.6	9.1	11.6	13.4
Pasta	10.0	10.0	9.9	10.5	11.3	12.9	14.4	17.1
Breakfast Cereals	12.9	13.0	13.1	13.4	14.0	14.4	14.8	15.2

UNITED STATES: Civilian Per Capita Consumption of Major Food Commodities (retail weight) 1/, 1980 - 1987 2/

COMMODITY	1980	1981	1982	1982	1984	1985	1986	1987 2/
				Pounds				
CALORIC AND LOW-CALORIE								
Sweeteners 15/ 16/	132.8	133.2	132.5	137.4	142.5	149.3	147.7	151.6
Sugar (refined) 17/	83.6	79.3	73.6	71.0	67.6	63.4	60.8	62.4
Corn Sweeteners (dry weight) 15/ 18/	40.2	44.5	48.1	52.1	57.8	66.5	67.1	68.8
Low-calorie Sweeteners 19/	7.7	8.2	9.5	12.9	15.8	18.1	18.5	19.0
OTHER								
Coffee	7.7	7.7	7.6	7.6	7.5	7.6	7.6	7.6
Cocoa (chocolate liquor equiv.)	2.7	2.9	3.0	3.2	3.4	3.7	3.8	3.9
Peanuts (shelled)	4.8	5.5	5.9	5.9	6.0	6.3	6.4	6.4
Dry Edible Beans, Peas, & Lentils 10/	5.8	5.8	6.9	7.2	5.5	7.4	7.1	8.3
Soft Drinks (gallons)	27.1	27.1	26.9	26.9	27.2	29.1	30.3	--
Citrus juice (gallons)	5.1	4.8	5.1	5.6	4.8	5.2	5.6	5.3

1/ Quantity in pounds, retail weight unless otherwise shown. Data on calendar year basis except for dried fruits, fresh citrus fruits, peanuts and rice which are on a crop-year basis.
2/ Preliminary.
3/ Total may not add because of rounding.
4/ Plain and flavored.
5/ Lowfat, skim, buttermilk, and flavored drinks.
6/ Heavy cream, light cream, and half and half.
7/ Includes 80 percent of the product weight of butter and margarine and all of the product weight and other fats and oils, some of which are not shown separately.
8/ Excludes apples, applesauce, cranberries, pineapple, and citrus sections.
9/ Includes asparagus, broccoli, carrots, cauliflower, celery, sweet corn, lettuce, onions, and tomatoes.
10/ Farm weight.
11/ Used in such processed products as ketchup, canned tomatoes, tomato paste, and tomato puree.
12/ Includes asparagus, carrots, green peas, snap beans, and sweet corn.
13/ Includes asparagus, broccoli, carrots, cauliflower, green peas, snap beans, and sweet corn.
14/ White, whole wheat, semolina, and durum flour.
15/ Dry weight equivalent.
16/ Includes edible syrups and honey.

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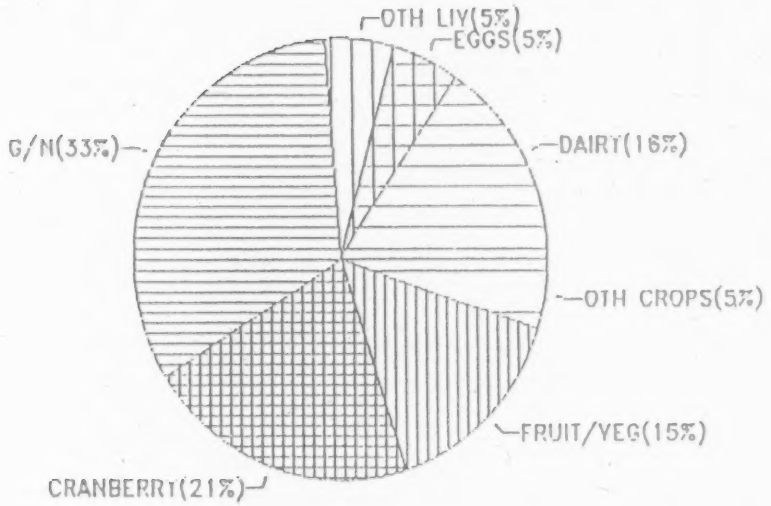
MASSACHUSETTS
1988 CASH RECEIPTS



CASH RECEIPTS FROM FARM MARKETINGS, MASSACHUSETTS, 1986-1988

COMMODITY	1986	1987	1988	COMMODITY	1986	1987	1988
	1,000 Dollars				1,000 Dollars		
CROPS				LIVESTOCK			
Hay	6,318	5,356	4,458	Cattle and Calves	12,502	13,130	5,918
Tobacco	7,062	5,273	8,043	Hogs and Pigs	4,009	4,016	3,506
Potatoes	3,404	4,107	3,815	Sheep and Lambs	486	524	521
Corn, Sweet	13,825	10,096	11,594	Dairy Products	76,039	70,532	62,778
Tomatoes	6,985	8,125	5,775	Chickens, Farm	557	531	179
Misc. Veg.	13,054	12,750	12,790	Eggs	24,675	20,475	20,305
Apples	18,297	17,671	19,746	Turkeys	2,824	2,772	3,060
Peaches	864	1,385	1,155	Other Poultry	2,972	2,562	2,562
Cranberries	81,222	64,336	84,804	Misc. Livestock	5,449	6,052	6,155
Other Berries	2,750	5,500	5,500				
Misc. Fruit	475	475	475	TOTAL LIVESTOCK	129,513	120,594	104,984
Maple	753	890	1,610	ALL COMMODITIES	404,276	390,011	402,377
Greenhse/Nursery	116,604	127,838	131,370				
Misc. Crops	3,150	5,615	6,258				
TOTAL CROPS	274,763	269,417	297,393				